REMEDIAL ACTION WORK PLAN FOR PHASE 2 DREDGING AND FACILITY OPERATIONS IN 2011

HUDSON RIVER PCBs SUPERFUND SITE

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ACRONYMS AND ABBREVIATIONS

ARARs	Applicable or relevant and appropriate requirements
CD	Consent Decree
CDE	Critical Phase 2 Design Elements (Attachment A to SOW)
cfs	cubic feet per second
CFR	Code of Federal Regulations
CHASP	Community Health and Safety Plan
CM	Construction Manager
CU	certification unit
cy	cubic yard
D&FO	Dredging and Facility Operations
DBH	diameter at breast height
DGPS	differential global positioning system
DoC	Depth of Contamination
DQAP	Dredging Construction Quality Control/Quality Assurance Plan
EGIA	East Griffin Island Area
EHS	environmental health and safety
EPA	United States Environmental Protection Agency
EPS	Engineering Performance Standards
FDR	Final Design Report
FSWC	facility site work construction
GE	General Electric Company
GPS	global positioning system
HASP	Health and Safety Plan
HCC	Habitat Construction Contractor
MPA	mass per unit area
NTIP	Northern Thompson Island Pool
NYSCC	New York State Canal Corporation
NYSDEC	New York State Department of Environmental Conservation
O&M	operation and maintenance
OSHA	Occupational Safety and Health Administration

ACRONYMS AND ABBREVIATIONS (CONTINUED)

PAP	Property Access Plan
PCBs	polychlorinated biphenyls
PFOC	Processing Facility Operations Contractor
PPE	personal protective equipment
PSCP	Performance Standards Compliance Plan
QA	quality assurance
QC	quality control
QoLPS	Quality of Life Performance Standards
RA	Remedial Action
RA CHASP	Remedial Action Community Health and Safety Plan
RA HASP	Remedial Action Health and Safety Plan
RAM QAPP	Remedial Action Monitoring Quality Assurance Project Plan
RAWP	Remedial Action Work Plan
RFW	Riverine Fringing Wetland
RM	River Mile
ROD	Record of Decision
RTK	Real Time Kinematic
RYOC	Rail Yard Operations Contractor
SAV	Submerged (and floating) Aquatic Vegetation
SOW	Statement of Work for Remedial Action and Operations, Maintenance and Monitoring
TDP	Transportation and Disposal Plan
TID	Thompson Island Dam
TSS	Total Suspended Solids
WQ Requirements	Substantive Water Quality Requirements

SECTION 1

INTRODUCTION

In 2005, the General Electric Company (GE) and the United States Environmental Protection Agency (EPA) executed a Consent Decree (CD) relating to the performance of the Remedial Action (RA) selected by EPA to address polychlorinated biphenyls (PCBs) in sediments of the Upper Hudson River, located in New York State, through dredging, as described in EPA's February 2002 Record of Decision (ROD) for the Hudson River PCBs Superfund Site (EPA 2002). The CD was filed in federal district court on October 6, 2005 (EPA/GE, 2005) and was approved and entered by the court as a final judgment on November 2, 2006, when it went into effect.

In accordance with the ROD and the CD, the RA was to be conducted in two phases. Phase 1 was defined as the first year of dredging and was conducted by GE in 2009. Phase 2 consists of the remainder of the dredging project. The CD provided an option to GE, following EPA's decision regarding the Performance Standards and scope of Phase 2, as to whether to elect to perform Phase 2 under the CD. After an intensive peer review process, EPA issued its decision regarding the Performance Standards and scope of Phase 2 in December 2010; and GE has elected to perform Phase 2 under the CD.

The CD includes, as Appendix B, a Statement of Work (SOW) for Remedial Action and Operations, Maintenance and Monitoring, which sets forth a number of general requirements for the RA and includes several attachments specifying requirements for various aspects of the RA. EPA issued revised versions of the SOW and its attachments for Phase 2 in December 2010. For the work to be performed in each construction year of Phase 2, Section 3.1 of the revised SOW requires GE to submit, by February 15 of that year (or such alternate date as is agreed to by GE and EPA), a Remedial Action Work Plan (RAWP) for Phase 2 Dredging and Facility Operations for such year, along with any remaining design documents (or revisions or addenda to previously approved design documents) for the dredging to be performed in that year.

This *Remedial Action Work Plan for Phase 2 Dredging and Facility Operations in 2011* (2011 RAWP) constitutes GE's RAWP for the dredging to be performed in the first year of Phase 2, which is 2011. As discussed further below, this RAWP includes several appendices, and references certain other documents, providing additional information on GE's plans for dredging and facility operations in 2011. This version of the 2011 RAWP represents a revision of prior versions submitted to EPA on February 15 and April 1, 2011, revised to reflect comments received from EPA, discussions with EPA, and other updated information, and was approved by EPA on April 26, 2011. In addition, GE has submitted to EPA a *Phase 2 Final Design Report for 2011* (2011 FDR) (initially submitted on March 15, 2011, revised on April 19, 2011, and approved by EPA on April 26, 2011), which provides GE's design plans for the first year of Phase 2.

1.1 PROJECT SETTING

The Upper Hudson River is defined as the section of river from Fenimore Bridge in Hudson Falls to the Federal Dam at Troy, New York. The ROD calls for, among other things, a remedial action to remove and dispose of sediments containing PCBs from the Upper Hudson River. Sediments to be removed are defined based on the PCB mass per unit area (MPA) and surface concentration criteria (see EPA, 2002).

The ROD defined three sections of the Upper Hudson River for the sediment remediation activities:

- River Section 1: Former location of Fort Edward Dam to Thompson Island Dam (TID) (from river mile [RM] 194.8 to RM 188.5; approximately 6.3 river miles);
- River Section 2: TID to Northumberland Dam (from RM 188.5 to RM 183.4; approximately 5.1 RM); and
- River Section 3: Northumberland Dam to the Federal Dam at Troy (from RM 183.4 to RM 153.9; approximately 29.5 river miles).

As noted above, the ROD called for this remedial action is to be conducted in two phases. Phase 1, completed in 2009, was conducted in a portion of River Section 1. Phase 1 also included construction of a land-based sediment processing facility adjacent to the Champlain Canal. Phase 2 covers the remaining dredging in all three river sections. The 2011 Phase 2 work will consist of dredging in a portion of River Section 1 that was not addressed in Phase 1.

1.2 2011 PHASE 2 CONTRACTS

The project scope for the 2011 Phase 2 activities addressed in this 2011 RAWP will be conducted under four separate primary contracts, Contracts 30, 40, 50, and 60, described below:

- Contract 30 – Processing Facility Operations, covers sediment processing facility operations and maintenance, including barge unloading, coarse material separation, sediment dewatering, loading of debris, coarse material and dewatered sediment into empty rail cars, treatment of process water and storm water, site storm-water management, and staging area management and maintenance. This contract also requires that, during the 2011 off-season, the contractor will winterize the sediment processing facility and operate and maintain the storm water collection and treatment systems. The contractor selected to carry out these activities under Contract 30 is referred to as the Processing Facility Operations Contractor (PFOC) throughout this 2011 RAWP.
- Contract 40 – Dredging Operations, covers debris removal, shoreline vegetation pruning, dredging operations, the transport of loaded sediment barges to the sediment processing facility, supply and placement of appropriate backfill or cap materials, performance of appropriate shoreline stabilization measures, and repair and planting of shoreline areas above the 119-foot elevation contour if disturbed during dredging

operations. The contractor selected to carry out these activities under Contract 40 is referred to herein as the Dredging Contractor.

- Contract 50 – Habitat Construction includes supply and planting of submerged aquatic and floating vegetation (SAV) and riverine fringing wetland vegetation (RFW) in certain areas dredged in 2011. The contractor selected to carry out Contract 50 activities is referred to herein as the Habitat Construction Contractor (HCC).
- Contract 60 – Rail Yard Operations, include all activities required to operate and maintain the rail yard. These will primarily involve setting up of outbound loaded trains, and receiving inbound empty trains. The contractor selected to perform these activities under Contract 60 is referred to herein as the Rail Yard Operations Contractor (RYOC).

These activities are referred to collectively herein as the 2011 Dredging & Facility Operations (2011 D&FO). In addition to the specific contractors described above, Parsons Engineering of New York, Inc. (Parsons) will provide construction management services to GE during the 2011 D&FO. Parsons is referred to as the Construction Manager (CM) throughout this 2011 RAWP. Figure 1-1 provides a chart that shows the lines of communication between the different groups involved in the project.

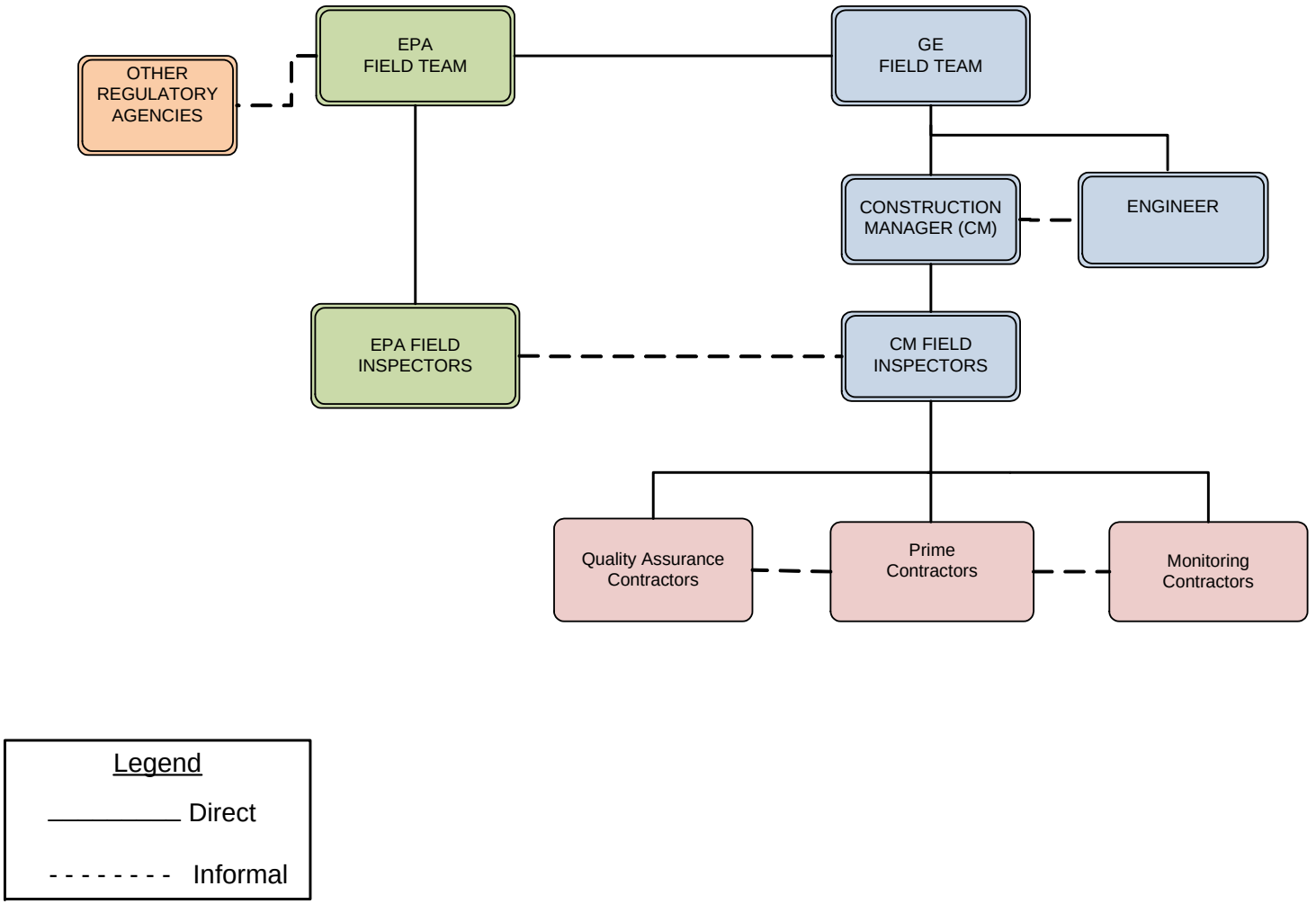
1.3 2011 RAWP AND ASSOCIATED DOCUMENTS

This 2011 RAWP consists of the main text and six appendices containing other specific plans. In addition, as part of this submittal, a *Phase 2 RA Health and Safety Plan for 2011* (2011 HASP) is provided separately. The constituent parts of this package are further described below. These documents have been developed to be consistent with the revised versions of the SOW and its attachments issued by EPA for Phase 2 in December 2010, with certain clarifications and modifications, based on discussions with EPA. Those SOW attachments include a document titled *Critical Phase 2 Design Elements* (Phase 2 CDE, Attachment A to the revised SOW), a *Phase 2 Remedial Action Monitoring Scope* (Phase 2 RAM Scope, Attachment B to the revised SOW), a *Phase 2 Performance Standards Compliance Plan Scope* (Phase 2 PSCP Scope, Attachment C to the revised SOW), and a *Phase 2 Remedial Action Community Health and Safety Program Scope* (Phase 2 RA CHASP Scope, Attachment D to the revised SOW).

2011 RAWP (main text) – provides an overview of the Phase 2 RA and 2011 RAWP, a description of the dredging operations and habitat construction activities to be performed during the 2011 season of Phase 2, a description of the equipment staging for dredging operations and habitat construction, a construction schedule, and a dredge production schedule.

Appendix A: ***Phase 2 Dredging Construction Quality Control/Quality Assurance Plan for 2011*** **(2011 DQAP) –** provides a description of the quality control and quality assurance (QC/QA) systems that will be established and followed by GE in the 2011 season to verify compliance with the approved technical specifications included in the Phase 2 FDR as approved by EPA. The QC/QA program described in the DQAP applies to the sediment processing facility operations, the dredging operations, the habitat construction, and the rail yard operations.

Figure 1.1 Project Lines of Communication



Appendix B: ***Phase 2 Facility Operations and Maintenance Plan for 2011*** **(2011 Facility O&M Plan) –** provides the following: (a) a description of the operation and maintenance of the sediment processing facility to be used by GE during the 2011 season of Phase 2 (including all aspects of the sediment processing operations); (b) a description of manpower requirements; (c) a contingency plan for unplanned maintenance of critical equipment; (d) a description of worker health and safety measures, decontamination procedures for personnel and equipment, spill control and response measures, and contractor noise and light monitoring to be implemented at the sediment processing facility; and (e) a description of the shut-down procedures to be performed at the conclusion of the 2011 dredging season and the maintenance activities to be undertaken at the facility during the 2011 off-season.

Appendix C: ***Phase 2 Transportation and Disposal Plan for 2011*** **(2011 TDP) –** describes the transport and disposal of dewatered sediments and debris by GE during the 2011 season of Phase 2. The plan includes a description of the wastes and materials to be transported, a description of the means of transport, the waste destination, loading procedures and the record-keeping associated with the transport and disposal of the waste and materials. This plan will be updated no later than May 1, 2011 to reflect disposal site and rail transportation arrangements.

Appendix D: ***Phase 2 Performance Standards Compliance Plan for 2011*** **(2011 PSCP) –** describes the actions that GE will take during the 2011 season of Phase 2 to implement the Engineering Performance Standards (EPS), Quality of Life Performance Standards (QoLPS), and substantive water quality requirements (WQ Requirements) issued (or revised) by EPA for Phase 2 of the RA.

Appendix E: ***Phase 2 Property Access Plan for 2011*** **(2011 PAP) –** identifies the procedures that GE has followed and will follow to obtain access agreements, leases, easements or title with respect to all properties to which access is needed for purposes of implementing the D&FO work during the 2011 season of Phase 2.

Appendix F: ***Phase 2 Community Health and Safety Plan for 2011*** **(2011 CHASP**) addresses potential community health and safety issues for the public in the vicinity of the work to be performed in the 2011 season of Phase 2. This plan describes potential hazards and impacts to members of the local community, and the steps that GE and its contractors will take to prevent and respond to them.

Phase 2 Remedial Action Health and Safety Plan for 2011 **(2011 RA HASP)** (provided separately) **–** constitutes an updated version of the Phase 1 RA HASP (Parsons, 2008) that was originally submitted in April 2007 and August 2008 and reviewed by EPA. The 2011 RA HASP (Parsons, 2011) addresses potential worker health and safety issues for GE and its contractors' workers in the course of the the 2011 season of Phase 2. The 2011 RA HASP describes potential hazards and impacts to project workers, and the steps that GE and its contractors will take to prevent and respond to them.

Although not included in the 2011 RAWP submittal, the *2011 Remedial Action Monitoring Quality Assurance Project Plan* (2011 RAM QAPP) is an integral work plan to the 2011 D&FO.

The 2011 RAM QAPP will be submitted separately from 2011 RAWP. It describes in detail the monitoring and sampling activities to be conducted by GE during the 2011 season of Phase 2. It addresses sample collection, analysis, and data handling activities for samples to be collected during the 2011 season.

In accordance with the revised SOW, the above-listed documents will be further revised and updated for each subsequent year of Phase 2, and will be submitted to EPA for review and approval.

1.4 DELIVERABLE REQUIREMENT INDEX

The 2011 RAWP submittal has been developed pursuant to Sections 3.1.1 [2011 RAWP] and 3.1.3 [2011 RA HASP] of the 2010 revised SOW attached to CD. Table 1-1 provides an index specifying where each pertinent requirement of the revised SOW is addressed.

Table 1-1 SOW/2011 RAWP Cross-Reference Table

Requirement	Citation	2011 RAWP Location
Detailed description of major remediation and construction activities	SOW Section 3.1.1 (page 3-17), cross-referencing Section 2.3.2.2 of the SOW	Section 2 describes dredging operations and Section 3 describes habitat construction; the 2011 Facility O&M Plan in Appendix B describes the processing facility operations; and the 2011 TDP in Appendix C describes rail yard operations.
Monitoring events and compliance monitoring	Same as above	Compliance monitoring is described in detail in the 2011 RAM QAPP. It is summarized in the 2011 PSCP in Appendix D and in Section 5 of this 2011 RAWP. Monitoring to be carried out by contractors for construction/operation purposes is discussed in Section 6 and, for the PFOC and RYOC, in the 2011 Facility O&M Plan in Appendix B.
Construction QA procedures	Same as above	The 2011 DQAP in Appendix A
Equipment staging	Same as above	Section 2 describes dredging equipment staging and Section 4 describes habitat construction equipment staging
Construction schedule	Same as above	Section 4
Phase 2 Dredging Construction Quality Assurance Plan	Same as above	The 2011 DQAP in Appendix A
Phase 2 Performance Standards Compliance Plan	Same as above	The 2011 PSCP in Appendix D

Requirement	Citation	2011 RAWP Location
Phase 2 Property Access Plan	Same as above	The 2011 PAP in Appendix E
Phase 2 Transportation and Disposal Plan	Same as above	The 2011 TDP in Appendix C (to be updated no later than May 1, 2011)
Phase 2 Facility O&M Plan	Same as above	The 2011 Facility O&M Plan in Appendix B
Phase 2 Community Health and Safety Plan	Same as above	The 2011 CHASP in Appendix F
Updates to Phase 1 RA HASP	SOW Section 3.1.3 (page 3-18)	2011 RA HASP (separate, stand-alone document)

1.5 2011 RAWP ORGANIZATION

This 2011 RAWP is organized as follows:

Section 1 – Introduction: provides an introduction to and overview of this 2011 RAWP and associated documents, an index specifying where each pertinent requirement of the SOW is addressed, and an outline of the plan's organization.

Section 2 – 2011 Dredging Operations: describes the work to be performed by the Dredging Contractor pursuant to Contract 40 (Dredging Operations), including: (a) an overview of the dredging operations process; (b) mobilization activities; (c) equipment staging; (d) shoreline vegetation pruning; (e) debris removal; (f) sheen response and other water quality controls; (g) dredging operations; (h) dredged material transport; (i) anchoring; (j) shoreline stabilization; (k) placement of backfill and engineered caps; (l) hydrographic surveying during dredging operations; and (m) demobilization activities.

Section 3 – 2011 Habitat Construction describes the work to be performed by the HCC pursuant to Contract 50 (Habitat Construction), including: (a) pre-construction and mobilization activities; (b) equipment staging; (c) pre-planting survey; (d) transport of plants; (e) RFW planting; (f) SAV planting; (g) repair and planting of shoreline areas above the 119-foot elevation if they are disturbed during dredging operations; (h) plant monitoring events; (i) spring re-planting in the year after initial habitat construction; (j) anchoring; and (k) demobilization activities.

Section 4 – Construction Schedule: presents the construction schedule for the the 2011 D&FO activities and the dredge production schedule, identifying the target monthly volume of *in situ* sediment to be dredged. This section also includes the qualifications and assumptions related to the construction and dredge production schedules and the interfaces between contracts.

Section 5 – Compliance Monitoring: provides a brief overview of the monitoring to be performed by GE during the the 2011 D&FO to assess achievement of the Phase 2 EPS, QoLPS,

and WQ Requirements. More details regarding this monitoring are provided elsewhere – mainly in the 2011 RAM QAPP.

Section 6 – Health, Safety, and Environmental Protection Measures: discusses: (a) the health and safety policy, program and plan to be implemented during the 2011 D&FO (including general worker health and safety measures); (b) personnel decontamination; (c) spill and storm water pollution prevention and spill and response; (d) emergency contact numbers and (e) the monitoring to be conducted by the PFOC, RYOC, Dredging Contractor, and HCC to verify compliance with the contract specifications.

Section 7 – Report on 2011 Activities: describes the annual progress report to be submitted following the conclusion of the 2011 D&FO, as required by the revised SOW.

Section 8 – References: provides full bibliographic references to key documents referred to in the body of this 2011 RAWP.

1.6 2011 RAWP SUBMITTAL REVISIONS

Construction activities described herein are based on the design drawings and specifications for Contracts 30, 40, 50, and 60, subject to EPA approval. During implementation of the 2011 D&FO, revisions to this 2011 RAWP submittal may become necessary due to design changes, adaptive management changes made pursuant to Section 7 of the 2010 revised SOW, unexpected field conditions, or other reasons. When GE becomes aware that revisions will be necessary, and those revisions affect the approved schedule or alter the means or scope of the work set forth in this 2011 RAWP, GE will notify EPA of the proposed change and seek EPA approval.

SECTION 2

2011 DREDGING OPERATIONS

This section provides a discussion of the RA construction activities applicable to the 2011 dredging operations. 2011 dredging operations center around the dredging of sediment, but also include associated activities such as mobilization and demobilization activities, debris removal, shoreline vegetation pruning, dredged material transport, anchoring, placement of backfill and engineered caps, and shoreline stabilization.

The planned dredging operations activities are presented in the general chronological order in which they will initially occur. In order to complete the 2011 dredging operations within one construction season and to achieve the target production rates, many activities will occur simultaneously with multiple crews.

2011 dredge areas targeted for removal include designated portions of the river: west of Rogers Island (Certification Units [CU] 09 – 11); south of Rogers Island (CUs 12 – 16 and 19 – 30). These areas are shown in the 2011 Contract Drawings for Contract 40:

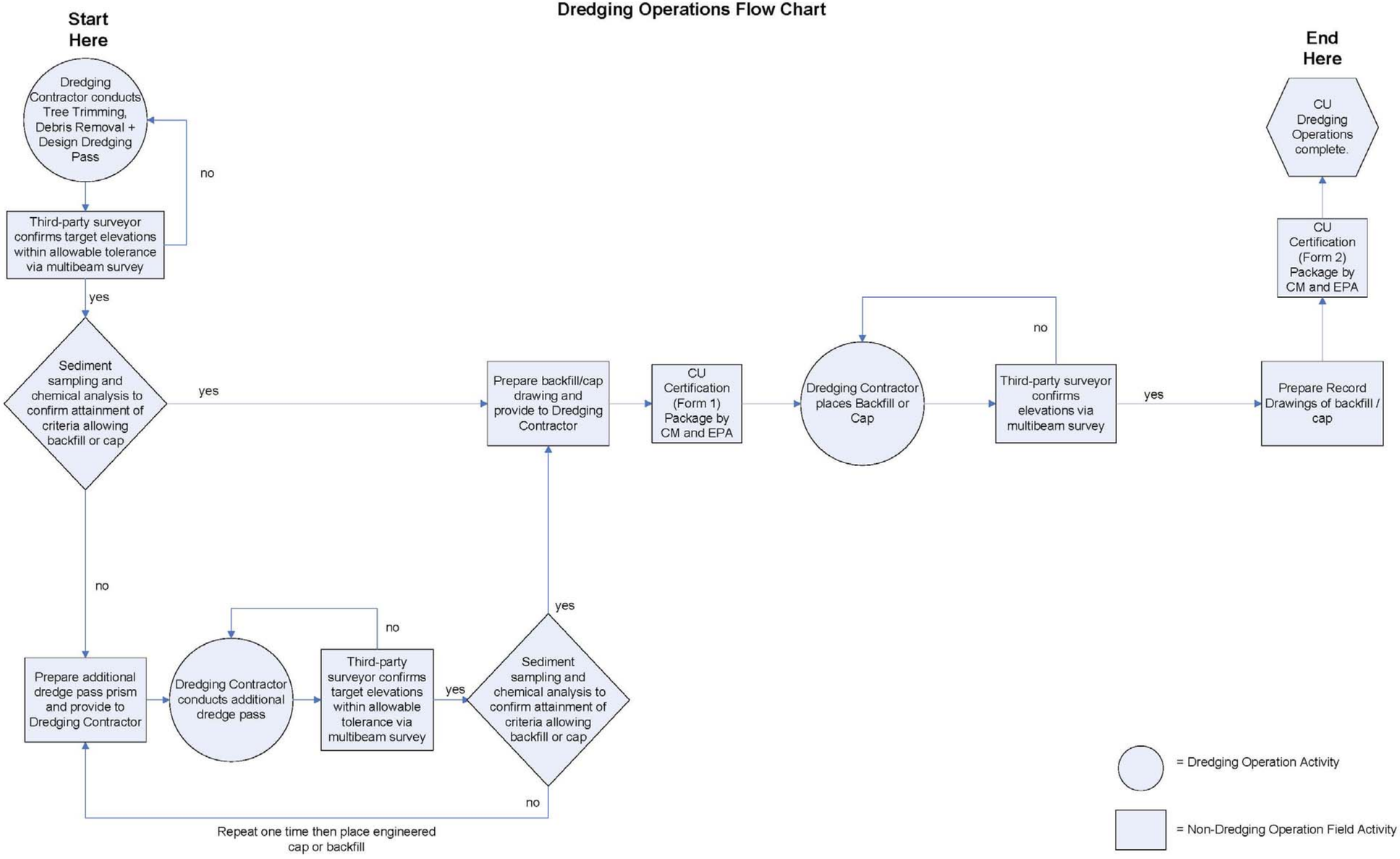
- Existing Conditions (G – Drawing Series);
- Dredging Operations (D – Drawing Series);
- Isolation Cap (C – Drawing Series); and
- Backfill (B – Drawing Series).

Information regarding sediment processing facility operations, including unloading of dredged materials, dewatering activities, and on-land transport and disposal, is contained in the 2011 Facility O&M Plan (Appendix B) and the 2011 TDP (Appendix C).

2.1 DREDGING OPERATIONS PROCESS

This section provides a brief overview of the dredging operations process. Figure 2-1 provides an illustrative schematic flow chart for the dredging operations sequence and evaluation as further described in the text below. Figures 2-2a and 2-2b show the location of the 20 CUs that are targeted for sediment removal during 2011 dredging operations.

Figure 2-1
Dredging Operations Flow Chart



Note: This flowchart diagram is intended to be an aid for reader to understand basic process steps and provided for "information only." Actual process will vary based on conditions and subject to requirements of the Residuals Performance Standard. Refer to Section 2 of the 2011 RAWP for more information and Section 4 of the PSCP (Appendix D to 2011 RAWP) for specific requirements.

Figure 2-2a

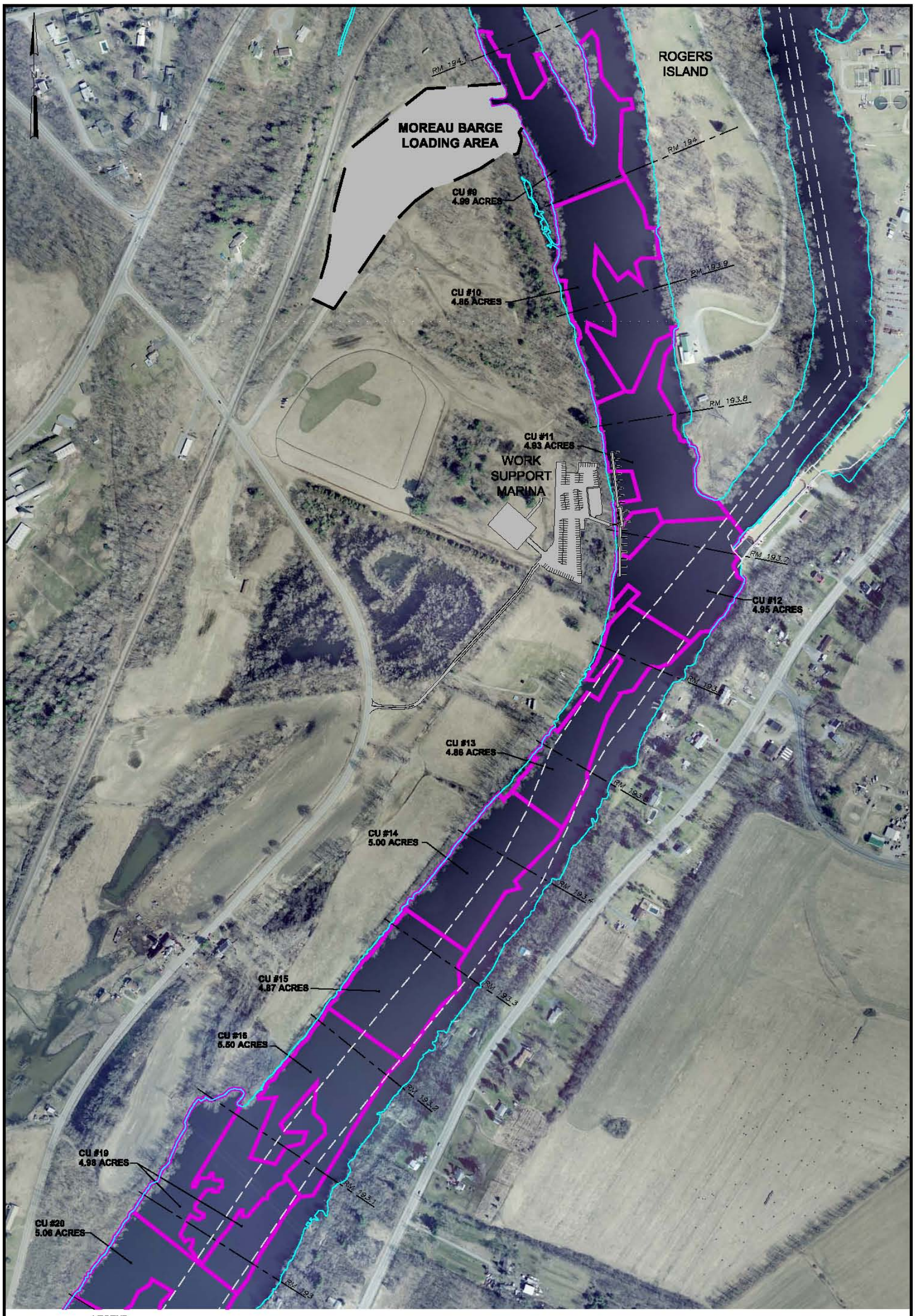
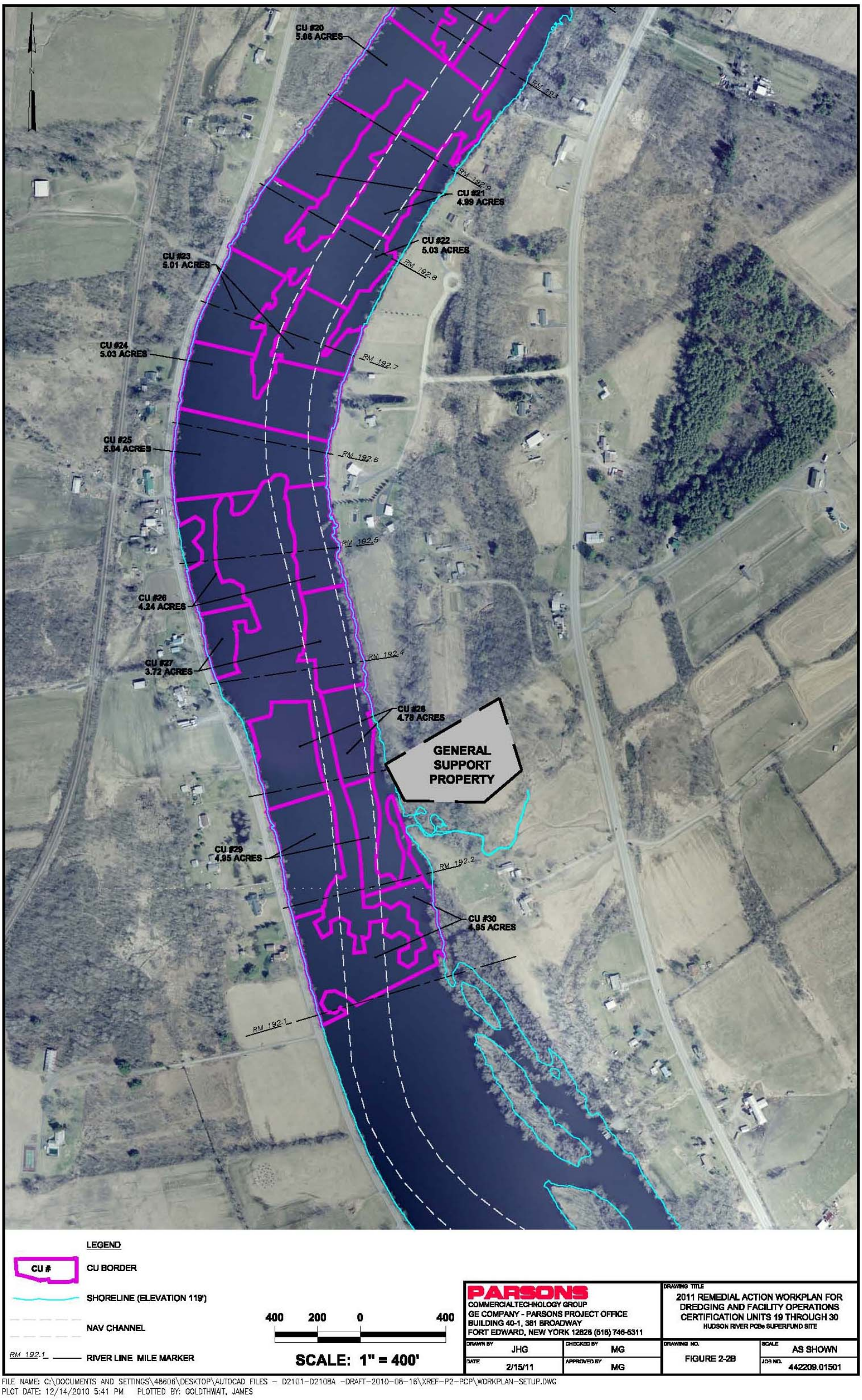

ROGERS ISLAND
MOREAU BARGE LOADING AREA
WORK SUPPORT MARINA
RM 194.1
RM 194
RM 193.9
RM 193.8
RM 193.7
RM 193.6
RM 193.4
RM 193.3
RM 193.2
RM 193.1
RM 193
CU #9 4.99 ACRES
CU #10 4.85 ACRES
CU #11 4.93 ACRES
CU #12 4.95 ACRES
CU #13 4.86 ACRES
CU #14 5.00 ACRES
CU #15 4.87 ACRES
CU #16 5.50 ACRES
CU #19 4.98 ACRES
CU #20 5.06 ACRES
LEGEND
CU #
CU BORDER
SHORELINE (ELEVATION 119')
NAV CHANNEL
RM 192.1
RIVER LINE MILE MARKER
400 200 0 400
SCALE: 1" = 400'
PARSONS
COMMERCIALTECHNOLOGY GROUP
GE COMPANY - PARSONS PROJECT OFFICE
BUILDING 40-1, 381 BROADWAY
FORT EDWARD, NEW YORK 12828 (518) 746-5311
DRAWING TITLE
2011 REMEDIAL ACTION WORKPLAN FOR DREDGING AND FACILITY OPERATIONS CERTIFICATION UNITS 9 THROUGH 16
HUDSON RIVER PCBs SUPERFUND SITE
DRAWN BY JHG
CHECKED BY MG
DATE 2/15/11
APPROVED BY MG
DRAWING NO. FIGURE 2-2A
SCALE AS SHOWN
JOB NO. 442209.01501
FILE NAME: C:\DOCUMENTS AND SETTINGS\48606\DESKTOP\AUTOCAD FILES – D2101-D2108A -DRAFT-2010-08-16\XREF-P2-PCP\WORKPLAN-SETUP.DWG
PLOT DATE: 12/14/2010 5:39 PM PLOTTED BY: GOLDTHWAIT, JAMES

Figure 2-2b


CU #20
5.06 ACRES
RM 193
RM 192.9
CU #21
4.99 ACRES
CU #22
5.03 ACRES
CU #23
5.01 ACRES
RM 192.8
CU #24
5.03 ACRES
RM 192.7
CU #25
5.04 ACRES
RM 192.6
RM 192.5
CU #26
4.24 ACRES
RM 192.4
CU #27
3.72 ACRES
CU #28
4.78 ACRES
GENERAL SUPPORT PROPERTY
CU #29
4.95 ACRES
RM 192.2
CU #30
4.95 ACRES
RM 192.1
LEGEND
CU #
CU BORDER
SHORELINE (ELEVATION 119')
NAV CHANNEL
RM 192.1
RIVER LINE MILE MARKER
400 200 0 400
SCALE: 1" = 400'
PARSONS
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BUILDING 40-1, 381 BROADWAY
FORT EDWARD, NEW YORK 12828 (518) 746-5311
DRAWING TITLE
2011 REMEDIAL ACTION WORKPLAN FOR DREDGING AND FACILITY OPERATIONS CERTIFICATION UNITS 19 THROUGH 30
HUDSON RIVER PCBs SUPERFUND SITE
DRAWN BY JHG
CHECKED BY MG
DATE 2/15/11
APPROVED BY MG
DRAWING NO. FIGURE 2-2B
SCALE AS SHOWN
JOB NO. 442209.01501
FILE NAME: C:\DOCUMENTS AND SETTINGS\48606\DESKTOP\AUTOCAD FILES – D2101-D2108A -DRAFT-2010-08-16\XREF-P2-PCP\WORKPLAN-SETUP.DWG
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The initial dredging operations work requires the completion of certain preparation activities before the actual dredging of sediment can begin.

- The dredge positioning control system will be set up and checked to verify that it is working properly.
- Overhanging vegetation will be removed such that dredging equipment is not restricted along the river shoreline.
- Known debris items (identified in the Contract 40 G-series drawings) will be removed within the dredge areas.
- Access dredging may be required at the mouth to a small inlet on the west shore of CU09.

The actual sediment dredging sequence will occur as prescribed in the specifications, moving from upstream to downstream locations in designated CUs, with each CU representing an area of approximately 5 acres, as described in the 2011 FDR. Dredging will be allowed to occur in a CU that is located immediately downstream of an upstream CU where dredging is being conducted. This is termed "concurrent CU dredging" and is in recognition of the fact that in order to achieve the target productivity rates, multiple dredge operations will have to work in close proximity. At any given time, concurrent CU dredging will only be allowed to occur in a maximum of three contiguous CUs. In the course of 2011 dredging operations, as more information regarding resuspension and the need for additional dredge passes is gained, the CM may revise the definition of concurrent CU dredging.

In order that the very shallow areas on the west side of CU19 can be dredged with minimal disturbance, the dredging contractor plans on dredging those areas when river elevations are elevated during the early part of the dredging season. This may result in CU19 being dredged outside of the above described sequence. In addition, there are a number of mounds in CUs 24, 25 and 26. One or more of these mounds may be targeted for test dredging early in the season. The aim of the test dredging would be to identify what material is in the mounds and to identify any issues with dredging them using the standard dredge configuration.

Except for the dredging detailed above, work is planned to start on the west side of Rogers Island with dredging in CU 09. Dredging will move sequentially from one CU to the next CU based on evaluation of completion of the dredging work in each CU. There will be concurrent operations in multiple CUs.

After the Dredging Contractor informs the CM that the dredge prism limits are achieved within the allowable dredge tolerances in a given CU or a sub-unit within that CU, a third-party hydrographic surveyor will perform a multi-beam survey of that CU or CU sub-unit to determine if the dredge limits have been achieved within the tolerances described in Section 13803 – Dredging, of the Contract 40 specifications. If that survey shows that the Dredging Contractor has not met those limits, the CM will direct the Dredging Contractor to conduct further dredging in certain areas of the CU. If that survey shows that those dredge limits have been met, sediment confirmation sampling will occur.

Assessing the compliance of dredging in shoreline areas using multi-beam measurements may be supplemented with single beam hydrographic survey data or land survey measurements, as described in the 2011 DQAP (Appendix A).

If the results of the sediment confirmation sampling indicate that the criteria specified in the 2011 PSCP (Appendix D) for backfilling or capping have been met, a backfill or engineered cap plan will be provided to EPA and to the Dredging Contractor, as applicable under the 2011 PSCP criteria, with the direction to place backfill or cap materials. In accordance with the EPA-approved design, backfill will not be placed in the navigation channel when post-dredge sediment elevations in the channel exceed 101.7 feet NAVD88. If the results of the sediment confirmation sampling indicate that re-dredging is necessary or appropriate under the criteria described in the 2011 PSCP (Appendix D), an additional dredging surface will be generated and the CM will direct the Dredging Contractor to re-dredge the necessary portions of the CU or CU sub-unit. This process may be repeated for a second and final re-dredge attempt following the criteria described in the 2011 PSCP (Appendix D).

Dredging along shorelines at the edges of CUs that extend to the shoreline will be addressed in accordance with the Phase 2 CDE (Attachment A to the revised SOW). As provided in the Phase 2 CDE, the maximum cut for initial dredging at a shoreline is 2 feet and the dredge slope cut will be limited to a 3:1 slope away from that cut (until it intersects the dredge prism based on elevation of contamination) to maintain shoreline stability. These shoreline areas will be sampled and evaluated in accordance with the procedures specified for such areas in the 2011 PSCP (Appendix D).

The Dredging Contractor will use best management practices to minimize resuspension of dredged sediment and to minimize the occurrence of visual plumes related to dredging operations.

Throughout the dredging process, sediments will be transported by barge through the Champlain Canal Lock 7 to the unloading wharf, where the sediments will be unloaded, dewatered, temporarily stockpiled, loaded into rail cars, and shipped via rail to the disposal facility, as described in the 2011 Facility O&M Plan in Appendix B and the 2011 TDP in Appendix C.

Once dredging is completed within each CU, the CM will direct the Dredging Contractor to place final backfill and/or engineered capping materials based on post-dredge sampling results. The type of backfill to be used is predetermined, as depicted in the Contract 40 B-series drawings. The type of cap to be placed will be dependent upon the river velocity and the residual PCB level at that location, as depicted in the Contract 40 C-series drawings.

Dredging Contractor operations will normally be performed 6 days per week, 24 hours per day. If necessary to meet production targets, the Dredging Contractor may work a 7th day after notifying the CM and receiving CM approval. In that event, the CM will advise EPA of the added work time before work is performed on the 7th day.

In the season following completion of the 2011 dredging operations, habitat construction work will occur, as described in Section 3 of this 2011 RAWP.

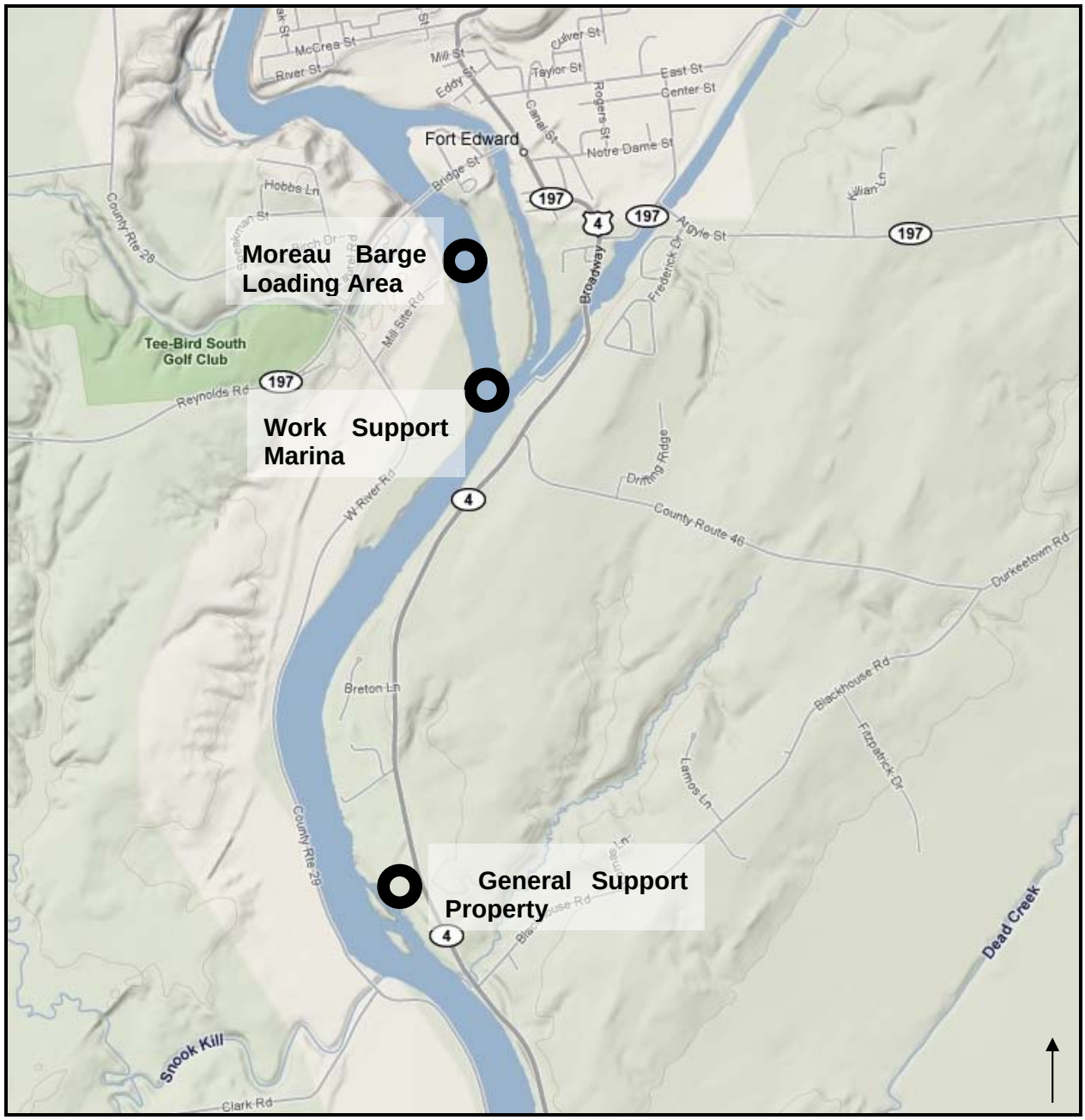
2.2 MOBILIZATION ACTIVITIES

This section briefly discusses the Dredging Contractor's mobilization activities to occur before the dredging operations can begin.

Mobilization is the process of procuring materials and equipment, transporting equipment, establishing the support facilities necessary to conduct the work, and providing project-specific training for construction and QC crews. A summary of the activities performed during dredging operations mobilization is provided below:

- Procure any necessary equipment in a timely manner so that it is available to mobilize per the schedule detailed in Section 4.
- Set-up field offices including project administration and communication systems.
- Confirm communication processes with CM, New York State Canal Corporation (NYSCC), PFOC, and other key parties.
- Establish on-site worker support systems for safety, sanitation, decontamination, etc.
- Set up signage, and other aids to navigation.
- Establish project survey control network.
- Transport equipment to site and establish systems for storage, fueling, repairs, and maintenance.
- Establish equipment positioning controls and field test.
- Launch and prepare floating equipment for operations and test operational control systems.
- Bring materials to site for environmental protection, spill response and sediment sheen response
- Create stockpiles of materials for initial backfill/cap placement.
- Conduct site training for contractor personnel.

The Dredging Contractor intends to mobilize a certain portion of its equipment in advance of the opening of the Champlain Canal by staging such equipment on a property that GE acquired and improved during Phase 1 activities in Fort Edward on Route 4 for staging of equipment and other materials and general support activities (General Support Property). The location of this property is shown in Figure 2-3. During the period before the opening of the Champlain Canal, the Dredging Contractor will use this property to stage, assemble, and place barges and other equipment into the river for implementation of 2011 dredging.



General Electric Company
Hudson River Project

Figure 2-3.
River Support Properties

Table 2-1 provides the list of major equipment to be utilized in the dredging process. The amounts and different types of equipment detailed in Table 2-1 have been selected to meet the target removal volumes for 2011 D&FO and provide sufficient flexibility to dredge in the range of river conditions found in the 2011 dredge areas. In order to meet the construction schedule detailed in Section 4, procurement of this equipment will be initiated immediately upon Contractor selection.

Table 2-1 List of Major Dredging Equipment

Construction Equipment	Quantity	Construction Activity	Description
Dredge Platforms	4	Dredging	Barge Mounted Excavator
Backfill / Cap Platforms	4	Backfill / Cap Placement	Barge Mounted Excavator
Regular Hopper Barges	17	Dredging	Hopper Barges for Dredging
Shallow Draft Hopper Barge	2	Dredging	Shallow Draft Hopper Barges for Dredging
Material Barges	10	Backfill / Cap Placement	Deck Barges for Backfill / Cap Material Transportation
Tugboats	17	Dredging / Backfill / Cap	Marine Transportation

As part of the dredging operations mobilization, an inspection by an independent licensed marine surveyor of on-site project-related marine equipment greater than 25 feet in length and all tow boats regardless of length will be performed to confirm sea worthiness and ability to perform their intended role and function.

2.3 EQUIPMENT STAGING

The Dredging Contractor's equipment will be staged at the Work Wharf, the equipment lay-down area, the Moreau Barge Loading Area, the General Support Property and the Work Support Marina, and will be spudded or anchored in the Hudson River or Champlain Canal. Both the Work Wharf and equipment lay-down area are located at the sediment processing facility. The locations of the Work Support Marina, the Moreau Barge Loading Area, and the General Support Property are shown in Figure 2-3.

2.4 SHORELINE VEGETATION PRUNING

Shoreline vegetation that overhangs the dredge area will be pruned to allow the safe and effective operation of dredge and shoreline stabilization equipment and minimize incidental

damage to trees. In some cases, trees or stumps with diameters at breast height (DBH) of 6 inches or more in the vicinity of or below the 119.0-foot elevation contour (as depicted in the drawings) will be left in place unless the Dredging Contractor proposes their removal and the CM approves. This pre-dredge pruning will begin with an evaluation and marking program to determine the extent of tree removal and pruning required. This evaluation will be based on a review of all tree trunks or limbs that protrude into the river beyond the shoreline dredge limit. Any designated removal will be reviewed with the CM, who will coordinate with shore-side property owners, as necessary, in accordance with the property access procedures described in the 2011 PAP in Appendix E. Only the vegetation/trees necessary to implement the dredging project will be removed. Tree removal and vegetation pruning will be conducted under the oversight of a Certified Arborist.

Vegetation removal and pruning will be accomplished using chain saws, pruning shears, and other similar cutting equipment provided by the contractor. Work from the waterside will be conducted using floats or barges that can support the necessary equipment and still operate in the shallow water along the shoreline. Some specialized long-reach equipment and man-lifts may be used to cut overhead branches and drop them on the barge deck positioned below. Work in archeologically sensitive areas will be completed consistent with Contract 40 Specification 01353 (Cultural Resources). After this activity is completed, a drawing depicting areas of shoreline vegetation removal and pruning will be provided to EPA.

The Dredging Contractor will chip the tree trimming debris on barges and into hoppers located on barges. This operation will comply with the Phase 2 QoLPS. Sound barriers or other engineering controls will be implemented on the tree chipping barges before chipping activities take place. To minimize the number of logs handled, trees with a DBH of up to 12 inches will be chipped. Logs that have a diameter of greater than 12” will be cut into 8’ lengths. Wood chips and logs will be off-loaded from barges at the General Support Property and trucked to the Washington County Transfer Station for reuse by the Washington County Department of Public Works.

Upon completion of the shoreline vegetation pruning activities, as-built drawings will be prepared that depict the limits of vegetation removal and tree pruning. This will be done by depicting shaded areas on the plans representing limits over which removal/pruning was conducted with dimensions based on project controls. Coordinate-based trim locations or removals for individual trees will not be identified.

2.5 DEBRIS REMOVAL

A separate operation to remove debris from identified locations in the Contract 40 G-series drawings will precede dredging operations at that location. This removal will be done using a hydraulic excavator or crane to lift and place debris on a debris barge. The excavator or crane will be equipped with one of the following attachments:

- Open bucket with opposable thumb;

- Grapple or similarly appropriate attachment to facilitate work;
- Conventional excavator bucket;
- Hydraulically operated bucket; or
- Orange peel grapple.

Debris will be unloaded and separately stockpiled for processing and disposal by the PFOC at the unloading wharf.

In spite of the designated debris removal effort, other debris may be encountered during dredging. When debris is encountered during dredging, it will be removed. Such removal may be conducted in the following ways:

1. If lifted from the bottom in the dredge bucket, debris may, to the extent practical, be loaded into one side of the hopper barge to be off-loaded and processed with other debris at the sediment processing facility.
2. If debris encountered during dredging cannot be removed with the dredge bucket, it may be marked for a return trip by a debris removal rig.

Alternatively, the Dredging Contractor may develop other debris removal techniques based on field experience.

No debris removal, dredging, mooring, or anchoring of vessels will be allowed in identified cultural resource areas marked in the drawings as "off limits." Workers will also be instructed regarding the potential for encountering previously unknown potentially significant archeological resources, as described in Specification 01353, during debris removal and dredging. As described in that specification, any potentially significant archeological resources that are encountered will not be further disturbed until the CM is notified and the determination is made whether a professional evaluation is required.

2.6 SEDIMENT SHEEN RESPONSE AND OTHER WATER QUALITY CONTROLS

During debris removal and dredging operations, the Dredging Contractor will take measures to minimize the movement of sediment-related sheens, and other water quality controls may also be implemented, as described below.

2.6.1 Sediment Sheen Response

When debris removal or dredging operations commence in an area identified as a Sediment Oil Sheen Response BMP area on the Contract Drawings, and in other areas when directed by the CM, the Dredging Contractor will deploy a control boom and oil absorbent materials (e.g., MyCelx Versimat) downstream of that dredging or debris removal activity. Once deployed, the Dredging Contractor will verify that the booms and absorbent materials are properly deployed to maximize their potential to control the sediment oil sheens. In addition, if sediment oil sheens are observed to have collected behind control booms or other stationary locations within the work areas, the Dredging Contractor will actively collect the sheens and other floating debris in contact with the sheens. If no sheens have been observed after 48 hours of conducting dredging

or debris removal activities in that location, the Dredging Contractor may request authorization to remove the booms and absorbent materials from the CM. If, after removing booms and absorbent materials, sediment sheens are later observed in that area the Dredging Contractor will immediately re-deploy the booms and absorbent materials and respond in accordance with Specification 13871.

2.6.2 Other Water Quality Controls

Other water quality controls may be implemented, if necessary, to control atypical situations during in-water operations (e.g., an accidental discharge). Such controls may include devices such as oil absorbing booms to control accidental oil leaks from marine equipment or floating booms to contain floating debris such as wood waste. The contractor will plan for the potential need for additional water quality controls and will provide sufficient equipment to be able to respond quickly to water quality issues that may potentially occur based upon observation of an event or as directed by the CM based upon results of the monitoring operations.

2.7 DREDGING OPERATIONS

All dredging will be done within a designated CU, working from upstream to downstream locations as described in Section 2.1 above and the Contract 40 technical specifications. Dredging is the removal of the specified prism of contaminated sediment in each CU as shown on the Contract 40 D-series drawings. Up to one design dredging prism and two additional dredge prisms may be provided to the Dredging Contractor for each CU. Additional dredge prisms will be issued if post-dredging sampling indicates sediment remains that require re-dredging as described in the 2011 PSCP in Appendix D. Plans for conducting each of these dredging operations are further detailed in this section.

During the course of dredging, the Dredging Contractor may identify specific portions of dredge areas, not previously identified in the design, where dredging would present unsafe work conditions (e.g., due to obstructions) or where the sediment or substrate conditions would make dredging very inefficient and/or cause undue delay to the schedule (e.g., locations with a very thin sediment layer and/or substrate consisting of rocks and cobbles). Consistent with the approach described in Step 4 in Section 2.4.3 of the CDE, GE may propose to exclude dredging in those specific areas, if any are encountered. In such a case, GE will inform EPA of its proposal to exclude the location from dredging and present its rationale for that exclusion. Any such proposed exclusion of dredge areas will be subject to EPA approval.

Such potentially unsafe areas may include those near fixed structures in or adjacent to dredge areas that have the potential to be weakened if their foundations or the armor stone protecting their foundations were to be dredged. In the interest of safety and minimizing risk of damage to these structures, the Dredging Contractor will determine a proposed revised dredge limit to establish an appropriate setback from the structure. The revised dredge limit will be subject to EPA review and approval. To minimize removal of armor stone protecting the foundations of these structures, a field survey will be undertaken at each structure to locate the armor stone. Generally, the Dredging Contractor will probe the 10-foot offset perimeter before dredging the

locations. If armor stone is located at the setback perimeter, the Dredging Contractor will continue probing to find the interface of the mud line and the rip-rap, then re-establish the dredge perimeter 10 feet into the river from that interface point, and dig on a 2:1 slope to the removal limit. The field survey methods may vary on a case-by-case basis depending on the field conditions but the goal of minimizing risk of damage to the foundations of the structure or removing armor stone protecting the foundations will remain the same.

If, through the course of the dredging work, the Dredging Contractor removes armor stone while digging around a structure or if the final dredge elevations are such that additional armor stone is determined by the CM to be appropriate, the Dredging Contractor may place additional armor stone at that location. If this occurs, EPA will notified and provided information regarding how the situation was addressed.

2.7.1 Dredging

Dredging will be accomplished mechanically utilizing hydraulically operated excavators equipped with enclosed 5 cy clamshell buckets. The dredge bucket will be fully enclosed such that when closed it will minimize loss of sediment from the bucket when raised from the river bottom until opened in the sediment barge hopper. All dredges will be equipped with a bucket positioning system to allow the dredge operator to accurately control the dredge operations horizontally and vertically. Dredged material will be placed in barges for transport by tugs through Lock 7 of the Champlain Canal to the sediment processing facility.

Approximately 350,000 cy of sediment are targeted to be removed from the river during the 2011 dredging operation. An initial ramp-up period is envisaged for the first two weeks of dredging. This is meant as a ramp-up period to allow the Dredging Contractor and PFOC to adjust and refine their operating procedures and does not set minimum or maximum productivity rates during that period. Increased production after the ramp-up period will be accomplished by progressively adding dredge plants up to a total of four dredge plants operating simultaneously. The Dredging Contractor will work in concert with the PFOC and the CM to optimize production while achieving the other goals of the 2011 season of Phase 2 of the RA.

The dredge platforms will utilize spuds to secure the platforms in the river. A spud is essentially a steel column, similar to a pile, which is secured to the barge and is moved up and down by utilizing a winch. The spud, through gravity, will secure the dredge platform in place. When the dredge platform is to be moved, either of the following forms of movement may be employed: (1) raising the spuds off the river bottom, moving with the assistance of a tug, and then lowering both spuds; or (2) moving by “crabbing” – a technique whereby the first spud is lifted and the barge is rotated about the second spud, then the first spud is lowered, then the second spud is lifted and the barge is rotated about the first spud, then the second spud is lowered (and repeated as necessary). Sediment barges will not be equipped with self-mooring equipment (i.e., spuds or ground tackle), but will be secured with mooring lines to dredge platforms, backfill/capping platforms, docks, or dolphins or will be moored in the fixed mooring field(s). Sediment barges will be moved with the assistance of tugboats.

Dredging will begin in CUs 09 and will continue sequentially downstream along the West Channel of Rogers Island to the southern tip of Rogers Island and thereafter downriver until approximately CU 30.

To accomplish dredging in shallow areas, the Dredging Contractor will utilize specialized dredging equipment and operating procedures. Although regular hopper barges will be used in shallow areas to the maximum extent possible, in some very shallow areas (e.g. small inlet on western shore of CU09 and west side of CU19) shallow draft hopper barges that are smaller than the standard sized hopper barges used in normal dredging operations, but larger than the "mini-hopper" units used during Phase 1 will be utilized. These shallow draft hopper barges used in very shallow areas will be designed to have shallow operating drafts and will be loaded only to the extent they will not come into contact with the river bottom during loading or transit in accordance with the specifications. These shallow draft hopper barge units will be fitted with coaming walls to receive and retain dredged material during transport.

As described in Section 2.1, dredging in shallow areas may be conducted during periods of higher river stage height to take advantage of the increased drafts this would provide dredges and hopper barges. In particular very shallow portions of CU19 (and possibly shallow portions of CU20 and 21) may be dredged in an opportunistic fashion when higher flows occur. This work may occur in the early portion of the season and might not adhere to the 3 concurrent CU rule. The Dredging Contractor may begin dredging in deeper portions of the river and complete dredge passes approximately parallel to the shoreline thereby creating additional draft for vessels as the dredge works toward the shoreline. To minimize the potential for generated residuals when dredging very shallow shoreline areas, the Dredging Contractor will begin by dredging sufficient material to provide sufficient depth to allow the dredging equipment to move into the shallow area and reach the top of the slope. During this initial cut the Dredging Contractor would not dredge to below the dredge prism. Once sufficient water depth was available the Dredging Contractor would remove sediment to below the dredge prism from the top of slope to the bottom of slope. This method will minimize the potential for any sloughed sediment to remain in the dredge area and force an additional dredge pass. The Dredging Contractor will coordinate with the CM when working in shallow areas, particularly when activities are planned during higher flows.

Access dredging is currently planned at the mouth of the small inlet on the western shore, as described in Section 2.1. This access dredging is needed to allow the bow of the dredge to enter the small inlet and remove the required material from the inlet. The mouth of the inlet will need to be widened by approximately 10 feet and sufficient material removed from the side slope to create a stable slope. If additional access dredging is necessary to provide sufficient depth for dredge equipment in shallow areas during the course of the work GE will inform and seek approval from EPA. It should be noted that GE is also proposing access dredging for the approach to the Moreau Barge Loading Area. As this is required for the transport of backfill and cap material barges it is detailed in Section 2.11.3, Transport to In-River Placement Locations.

When used, shallow draft hopper barges will be brought alongside a nearby dredge unit operating in deeper water that is loading a regular sized hopper barge and the shallow draft hopper barge will be transloaded by that dredge for transport to the Processing Facility.

During full production dredging, each CU will be completed and surveyed by the owner's third-party independent hydrographic surveyor prior to confirmation sediment sampling. If hydrographic surveys indicate that required dredge tolerances have not been met, dredging will resume until the hydrographic surveys shows that the required elevations have been achieved within the allowable tolerances. Residuals sediment sampling will then be conducted and sampling results will be analyzed to determine whether backfill or engineered caps may be placed or re-dredging is required under the criteria in the 2011 PSCP.

An exception to performing dredging to the required elevation limits is when bucket refusal (bedrock) or clay (Glacial Lake Albany Clay) areas are encountered. In either of these cases, the Dredging Contractor will notify the CM so that the CM can confirm the presence of clay or bucket refusal and provide approval for the revised elevation limits of dredging. Additionally, the CM will notify EPA if the Dredging Contractor encounters clay or bucket refusal before reaching the required elevation limit. Post-dredging survey and sampling will still be done in clay and bucket refusal areas of each CU to determine if backfill or a cap needs to be placed in those areas. If the Dredging Contractor does not encounter clay in the clay areas identified in the Contract 40 drawings but has reached the dredge prism elevation limit that was based on an assumed clay layer, the Dredging Contractor will inform the CM and will continue digging until reaching the Depth of Contamination (DoC) elevation that had been calculated using the core PCB data.

2.7.2 Positioning Control

The Dredging Contractor will use one of the following three approaches for determining and controlling the position of the dredge bucket, depending on conditions at the dredging location:

1. Story Pole;
2. Standard Inclinometer; or
3. Offset Inclinometer.

All three positioning approaches utilize Hypack's DredgePac software or a comparable software platform for integration, calculation, and graphical display of sensor and positioning data. Each can use either a real time kinematic (RTK) Global Positioning System (GPS) or Laser Robotic Tracking for positioning. Laser Robotic Tracking utilizes a machine-controlled robotic tracking sensor (gun) located on a shore-based survey control point. The robotic tracking gun continuously tracks a 360-degree prism mounted on the dredge and wirelessly transmits the calculated position or range and bearing to the dredge guidance computer. Laser Robotic Tracking may be used where physical obstructions prevent the use of the satellite based GPS.

The Story Pole approach uses a pole mounted directly to the bucket. An RTK GPS antenna or 360-degree prism for laser robotic tracking is mounted on top of the pole. Orientation of the

bucket is provided via a digital rotation sensor (digital compass or similar). Tilt and roll of the bucket is corrected using two inclinometers mounted at a right angle to each other on the story pole. A limit switch installed on the bucket indicates when the bucket has been closed. Sensor information is transmitted to the guidance computer mounted in the excavator cab. If Laser Robotic Tracking is utilized for positioning, a wireless link will be established between the base "gun" and the positioning system. A differential global positioning system (DGPS) utilizing moving base station RTK technology (CSI Crescent V100 or similar) to provide barge heading will provide barge positioning. DredgePac or similar software receives sensor information and displays the location of the barge and the three-dimensional location of the bucket. This information is displayed in the operator cab in plan and profile views.

The Standard Inclinometer approach utilizes a dual antenna system mounted directly to the excavator. The antenna provides RTK horizontal and vertical position, as well as heading. A series of inclinometers collects orientation (angle) information from each of the separate components of the excavator (car body, boom, stick, and bucket). The angles are used in calculations performed by DredgePac or similar software in conjunction with lengths of each of the excavator appendages (boom, stick and bucket) to calculate the position of the bucket. A rotary sensor mounted on the bucket determines the relative rotation of the bucket with respect to the stick. Tilt and roll of the bucket is corrected by two inclinometers mounted at a right angle to each other on the bucket. A limit switch is installed on the bucket to indicate when the bucket has been closed. Sensor information is transmitted to the guidance computer mounted in the excavator cab. A DGPS system utilizing moving base station RTK technology (CSI Vector or similar) to provide barge heading will provide barge positioning. DredgePac or similar receives sensor information and displays the location of the barge and the three-dimensional location of the bucket. This information is displayed in the operator cabin in plan and profile views.

The Offset Inclinometer approach utilizes a dual antenna system mounted directly to the barge that provides RTK horizontal and vertical position and heading of the barge. Heading of the excavator is determined using a sensor mounted in the center of the crane. A series of inclinometers collects orientation (angle) information from each of the separate components of the excavator (car body, boom, stick, and bucket). These angles are used in calculations performed by DredgePac in conjunction with lengths of each of the excavator appendages (boom, stick and bucket) to calculate the position of the bucket. A rotary sensor is mounted on the bucket to determine the relative rotation of the bucket with respect to the stick. Tilt and roll of the bucket is corrected for by two inclinometers mounted at a right angle to each other on the bucket. A limit switch is installed on the bucket to indicate when the bucket has been closed. Sensor information is transmitted to the guidance computer mounted in the excavator cab. A DGPS system utilizing moving base station RTK technology (CSI Crescent V100 or similar) to provide barge heading will provide barge positioning. DredgePac or similar software receives sensor information and displays the location of the barge and the three-dimensional location of the bucket. This information is displayed in plan and profile views in the operator cabin.

All three setups will provide the xyz coordinates for each bucket location. Additionally, a software driver used within the system records the necessary sensor information, including coordinates at a predetermined frequency, and stores the information in a file.

2.8 DREDGED MATERIAL BARGE TRANSPORT

Barges used to transport sediments will be certified as fit for duty, clearly marked for identification purposes, and also marked to record draft depth in the water (ullage markings). These ullage markings may also be used to determine the wet weight of sediment and water in each barge load. Each barge will only be loaded to the capacity that will ensure safe transport from the dredge location to the off-load location and prevent potential loss of sediment by overflowing of the barge hopper. Barge dimensions will vary with a maximum of 42 feet in width, in order to fit within Lock 7 of the Champlain Canal. Barges used to hold PCB-containing sediments, will be marked as containing PCBs in accordance with EPA's regulations under the Toxic Substances Control Act (TSCA) (40 CFR Part 761 Subpart C).

Before dredging in a given area, an empty sediment barge will be positioned adjacent to the dredge. In very shallow or confined areas, a shallow hopper barge with a capacity of approximately 100 cy will be used. In other areas, standard sized hopper barges with effective capacities of approximately 750 cy will be used. The time it takes to fill the barge will be dependent upon the individual dredge's production rate and other conditions. Typically, two tugs will be utilized to transport each empty and loaded hopper barge between the dredge area and the Processing Facility. Prior to transporting the hopper barge to the sediment processing facility, the Dredging Contractor will inspect the barge to make sure the exterior of the barge is free from sediment, in order to minimize the potential for losing sediment into the water during transport. To the extent possible, sediment found on the exterior of a sediment barge will be placed in the barge hopper, and if necessary, the barge will then be hosed down at the dredge site to avoid contamination of non-dredge areas.

Lock operators will be notified regarding the number of barges and anticipated timing of barge transport. After passage through Lock 7, the sediment-filled barges will be moored at the unloading wharf for unloading. The exterior of emptied barges will also be inspected to make sure the outside edges are clean of sediment before transport back through Lock 7 for continued dredging operations.

2.9 ANCHORING

This section describes the anchoring methods for vessels utilized for 2011 dredging operations under various project circumstances and conditions. Anchoring is addressed by specification 13820 and drawings D-4001 to D-4007. Anchoring requirements will vary during normal dredging operations, during non-work hours (e.g., Sundays), and during storm or high river flow conditions. Anchoring will not be permitted in areas that contain archaeologically sensitive sites and where caps have been installed. Anchored vessels and moorings will be

appropriately lit at all times. Safety of downstream facilities will be considered when finalizing anchoring locations.

2.9.1 Anchoring During Normal Dredging Operations

Work support platforms (e.g., platforms for dredging, debris removal, backfill/cap placement and sheet pile installation) will generally be held in position by spuds when dredging, backfilling or other on-water work is being performed. The spuds can then be raised or lowered utilizing a winch. To anchor the platform to the river bottom, the spuds will be lowered and, through gravity, will secure the dredge platform in place. When the platform is to be moved, the movement techniques described in Section 2.7.1 may be used. Sediment and other material barges will not be equipped with self-mooring equipment (i.e., spuds or ground tackle), but will be secured with mooring lines to spudded work platforms, docks, dolphins, the unloading wharf or other fixed moorings.

When support vessels and other small craft are not in transit, they will be secured to spudded work platforms, secured to slips at the Work Support Marina or secured to the Work Wharf. All support vessels will be equipped with appropriately sized ground tackle for use in emergencies.

2.9.2 Anchoring During Non-Working Periods

When not in active work mode (e.g., Sundays), spudded work platforms will be spudded down at or near their work location and outside of the navigation channel to the extent practical.

Sediment and other material barges not equipped with spuds will be secured with mooring lines to spudded work platforms, the unloading wharf, docks, dolphins or other fixed moorings.

Support vessels and other small craft will either be secured to spudded work platforms, secured to slips at the Work Support Marina, or secured to the Work Wharf.

Air monitoring in accordance with the 2011 RAM QAPP will continue during periods when uncovered barges containing sediment are staged at mooring posts or other locations.

2.9.3 Anchoring During Storm or High River Flow Conditions

During storm or high river flow conditions, the Dredging Contractor will determine if spudded work platforms, sediment and other material barges, and support vessels have to be moved to lower velocity portions of the river (e.g., closer to shore, into the land-cut portion of the Champlain Canal, below Crocker's Reef Gate in the Champlain Canal or secured to the Thompson Terminal or Fort Edward Yacht Basin Terminal walls) or can remain in the anchoring locations described above.

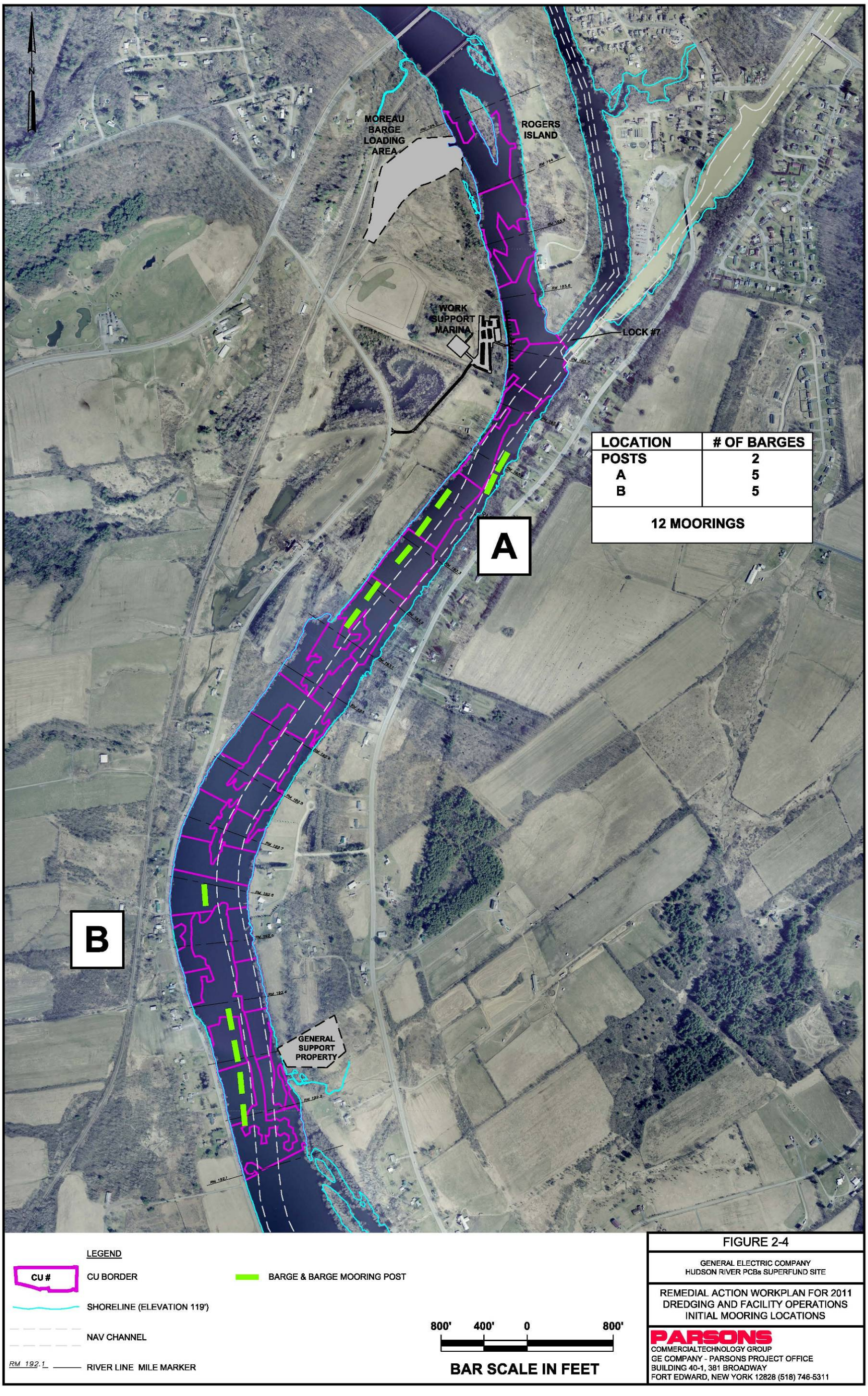
Tug boats operated by the Dredging Contractor will be available during storm or high river flow events to respond to situations as they arise. The decision to operate tugboats during high flows and/or storms will be at the discretion of tugboat captains, who have responsibility for safe operation of tugs.

2.9.4 Additional Mooring Locations

During the course of the dredging operations, it is expected that sediment barges and other material barges will be in transit or secured to spudded work platforms, the unloading wharf, or the mooring posts south of Lock 7. To cope with potential disruptions in the sediment barge unloading process or the transport of sediment and other material barges through the Champlain Canal system, the Dredging Contractor will have additional sediment and material barges available for use, as depicted on Figure 2-4. These barges will provide extra capacity during sediment processing facility shut-down times so as to allow the Dredging Contractor to keep dredging. However, during the course of dredging, these barges may not be used and would have to be anchored close to the job site. Additionally, during non-work periods the Dredging Contractor will need to have mooring locations close to the job site to moor barges and other marine equipment not in use. The additional mooring locations are shown in Figure 2-4.

Each mooring position in a mooring field will consist of a bow and stern mooring buoy attached to separate anchors. This arrangement will allow each end of the barge or other marine equipment to be secured and allows it to float parallel to the channel. Mooring positions will be located at the outside edge of the navigation channel such that the outside edge of moored equipment is 50 ft outside of the channel, and the mooring fields will be equipped with lighting in compliance with USCG and NYSCC regulations. The moorings will exclude any areas with submerged aquatic vegetation that are outside of areas to be dredged.

As dredging work progresses into an additional mooring location, the mooring anchors will be moved to a location downstream of the work or to a previously used additional mooring location if work in that location has been completed, no caps have been placed in the anchor locations, and no habitat backfill has been placed in the footprint of that additional mooring location. If additional mooring locations not already approved by EPA are proposed by the Dredging Contractor, GE will provide the proposed locations to EPA for review.


N
MOREAU BARGE LOADING AREA
ROGERS ISLAND
WORK SUPPORT MARINA
LOCK #7
LOCATION
OF BARGES
POSTS
2
A
5
B
5
12 MOORINGS
A
B
GENERAL SUPPORT PROPERTY
RM 192.4
RM 192.2
RM 192.1
LEGEND
CU #
CU BORDER
BARGE & BARGE MOORING POST
SHORELINE (ELEVATION 119')
NAV CHANNEL
RM 192.1
RIVER LINE MILE MARKER
800' 400' 0 800'
BAR SCALE IN FEET
FIGURE 2-4
GENERAL ELECTRIC COMPANY
HUDSON RIVER PCBs SUPERFUND SITE
REMEDIAL ACTION WORKPLAN FOR 2011
DREDGING AND FACILITY OPERATIONS
INITIAL MOORING LOCATIONS
PARSONS
COMMERCIALTECHNOLOGY GROUP
GE COMPANY - PARSONS PROJECT OFFICE
BUILDING 40-1, 381 BROADWAY
FORT EDWARD, NEW YORK 12828 (518) 746-5311

2.10 SHORELINE STABILIZATION

Shoreline stabilization includes the installation of short-term stabilization measures at shoreline locations where shoreline failure is observed or locations where there is a concern of such failure after dredging has occurred. Short-term stabilization measures may remain in place through dredging. Short-term stabilization measures may be left in place as part of long-term stabilization measures if they comply with the approved requirements for long-term stabilization measures in the contract drawings. Details of any long-term stabilization measures that differ from those identified in the contract drawings will be provided to EPA for approval prior to installation. Long-term stabilization measures will be installed as shown on the Contract 40 B-series drawings prior to, or as part of, backfilling. Repairs, including planting of vegetation, will be made to disturbed areas of the shoreline above the 119-foot elevation contour line. In the event that potentially significant archaeological resources, as defined in Contract 40 Specification 01353, or human remains are found during shoreline stabilization work, work in that area will stop and the CM will be immediately notified. The CM will then notify EPA.

Shoreline stabilization will be accomplished using the methods identified in the Contract 40 Specification 13898 and B-series Drawings. To the extent that access to shoreline properties is required, such access will be sought in accordance with the procedures set forth in the 2011 PAP. Shoreline stabilization will be installed utilizing a barge mounted excavator equipped with a conventional excavator bucket or hydraulic clamshell bucket. Materials will be placed in essentially the same manner as backfill/cap material placement.

The sequence of work and production rates will be determined by the requirements of the dredging and backfilling/capping operations.

2.11 PLACEMENT OF BACKFILL AND ENGINEERED CAPS

Placement of backfill or engineered caps will be performed by the Dredging Contractor.

Upon acceptance of completion of dredging within a CU, backfilling and capping requirements will be specified by the CM to the Dredging Contractor. The CM will determine the requirements for backfilling or capping based on the criteria specified in Section 4 of the PSCP and the Contract 40 specifications that are part of the 2011 final design, which consider such location-specific variables as remaining PCB concentrations, river velocity, and the designated type of habitat construction. Different forms of backfill and engineered cap designs have been specified for these purposes under various conditions, as specified in the Contract 40 Technical Specification 02206 and the B- and C-series Drawings and as briefly described below.

"Near-shore backfill" is backfill to be placed between the shoreline (elevation 119.0 feet) and an elevation of approximately 117.5 feet. Near-shore backfill will be placed to an elevation consistent with the existing bathymetry as presented on the 2011 Contract Drawings for Contract 40 (G – Drawings Series), and includes the supporting 3:1 (horizontal to vertical) side slope down to the adjoining backfill or cap surface.

"One-foot backfill" is to be placed on the river bottom following the completion of dredging, except in navigation channel areas with a post-dredging elevation above 101.7 feet or in other areas agreed to with EPA. The one-foot backfill layer can be either Type 1 material in areas of low river velocity or Type 2 material in areas of medium to high river velocity, as specified in Contract 40-series drawings.

"Habitat backfill" is supplementary backfill material that may be placed in areas in the river that currently support submerged (and floating) aquatic vegetation (SAV). These locations are shown in the 2011 FDR and were selected to meet the requirement in Section 2.7.1 of the CDE for placement of additional backfill with a post-dredging and backfill placement water depth of greater than 8 feet below the design water surface elevation. Potential placement locations for the additional backfill are shown on the 2011 Contract 40-series Drawings, including the final placement elevation (114.0 feet or existing bathymetry).

2.11.1 Material Sources

The Dredging Contractor has identified a number of sources of backfill and cap materials located in the Upper Hudson River Valley that may be used to provide such materials during 2011. These potential sources, including their locations, are listed in Table 2-2. It is currently anticipated that these sources will provide the necessary quantities and types of backfill/capping materials for 2011. However, if other sources of backfill or cap material are identified, GE will advise EPA of those sources.

Table 2-2 Potential Backfill and Cap Material Sources

Fill Type	Source	Location
Backfill Type 1 Material (Type "1") Backfill Type 2 Material (Type "2") Backfill Type 3 Material (Type "3") - Type 1	Harris Pit North Friedman Pit	Fort Ann, NY Fort Ann, NY
Coarse Gravel (Type "N"), Cobble Armor (Type "O"), Armor Stone (Type "P"), and Type "Q"	Hartford Quarry Peckham Quarry Pallette Stone Quarry	Fort Ann, NY Hudson Falls, NY Saratoga Springs, NY
Topsoil	Troy Topsoil	Mechanicville, NY

2.11.2 Backfill/Cap Material Loading Areas

Backfill and capping materials will be transported via truck from their sources to the Moreau Barge Loading Area (shown on Figure 2-3). This area is considered to be "entirely on-site" for purposes of Paragraph 8.a of the RA CD, as well as Section 121(e) of the Comprehensive

Environmental Response, Compensation and Liability Act (CERCLA) and 40 CFR 300.400(e). Routing for the transport of the backfill/cap materials from the sources identified in Table 2-2 to the Moreau Barge Loading Area is shown in Attachment 1. If any other sources are subsequently identified, GE will provide EPA with the routing from those sources to the loading area.

The Moreau Barge Loading Area consists of a number of components, including a material stockpile area, access roads, a truck scale area, a loading platform, a conveyor area, and support areas, as described below.

The stockpile area will be used for the temporary stockpiling of backfill and cap materials and the mixing of such materials as necessary to meet the relevant gradation or other specifications for the dredge area where they will be placed. A truck scale will be installed at the truck scale area near to the site entrance.

The loading platform will consist of a number of stationary barges which will be anchored in position with temporary anchors and spuds. This platform will include tie-off locations for the transport barges while they are staged prior to loading. All backfill/cap material except Type P stone will be loaded into the transport barges via conveyor. The conveyor will extend approximately 300 feet from the base of the stockpile area to the transport barges. Depending on the configuration of the conveyor selected, the conveyor may require support on both the landside conveyor area and the barge loading platform. Type P stone, due to its size and shape, if loaded through the Moreau Barge Loading Area, cannot be effectively loaded into barges with a conveyor so will be placed into barges using a crane or other heavy equipment.

The operations to be conducted at the Moreau Barge Loading Area, including stockpiling, mixing, and loading of the backfill and cap material, will comply with the substantive requirements of federal and state laws and regulations that are identified as applicable or relevant and appropriate requirements (ARARs). In addition, these activities will be subject to the Phase 2 QoLPS for noise and lighting as well as project dust and opacity requirements. The noise and light monitoring to be conducted at this area will be described in the 2011 RAM QAPP, and response actions to be taken in the event of an exceedance of the numerical criteria in those performance standards or in the event of a complaint will be those described in the 2011 PSCP (Appendix D). (Since the backfill and cap materials will not contain PCBs, ambient air monitoring to evaluate attainment of the air quality QoLPS for PCBs will not be necessary.)

If additional barge loading areas are needed during the 2011 dredging season GE will seek approval of those properties from EPA.

2.11.3 Transport to In-River Placement Locations

As discussed above, the backfill and capping materials will be stockpiled at the selected loading areas and may be mixed as necessary to meet the specifications for the dredge area where they will be placed. The materials will then be loaded by conveyor or crane into barges for transport to in-river placement areas. Barges carrying backfill or cap materials will be

transported to the next available backfill or cap placement rig for placement of the materials onto the river bottom.

An approach channel to the Moreau Barge Loading Area is proposed to be dredged to allow backfill and cap material barges to be loaded to an optimum draft during different river stage heights and to allow safer transit to and from the loading area. GE will provide additional details regarding the proposed depth and location of this approach channel as dredging progresses in CU09 and CU10.

2.11.4 Placement Methods

The Dredging Contractor will perform backfilling and engineered cap placement at the locations and to the thickness as provided by the CM during construction. The backfill or cap placement operations may utilize similar types of mechanical hydraulic excavator (backhoe) rigs, with similar platforms and bucket positioning approaches as used for dredging. An open-faced clamshell or excavator bucket or the equivalent will be used.

Backfill/capping "swath" plans will be developed by the Dredging Contractor for the backfill/cap areas, to provide the operator and project management personnel a guide by which to accurately and uniformly place the backfill/cap material. Based on the fill volume of the bucket and the width of the bucket when swung partially open, the Dredging Contractor will calculate and program swath lengths and patterns into the positioning software for the placement of material to the required lines and grades. Backfill and cap materials will be placed in accordance with the tolerances in the EPA-approved construction contract documents. Based on prior experience gained during Phase 1, releasing backfill or cap material will be released at the water surface to control placement accuracy and lift thickness.

The Dredging Contractor may choose to modify or change the method and equipment used to place backfill or cap materials. Such changes will be proposed to the CM for approval.

2.11.5 Positioning Control

The Dredging Contractor is required to establish an accurate method of horizontal and vertical control before it proceeds with any backfill/capping operations, subject to the approval of the CM. For this purpose, the Dredging Contractor will employ RTK DGPS to locate and control the horizontal position to within +/- 3 inches. Control of the bucket for backfill and capping operations will be maintained with DredgePac (or equivalent) software utilizing a dual antenna RTK DGPS system mounted directly to the excavator. This provides RTK horizontal and vertical positioning in addition to the heading of the excavator. A series of inclinometers collects orientation (angle) information. These angles will be utilized in calculations performed by DredgePac (or equivalent) in conjunction with the lengths of each of the excavator components to calculate the position of the bucket.

Sensor information will be transmitted to the guidance computer mounted in the excavator cab. Barge positioning will be provided by a positioning system utilizing Moving Base Station RTK technology to provide barge heading. The dredge guidance software receives sensor

information and displays the location of the barge and the three-dimensional location of the bucket. This information is displayed in the operator's cab. Sensors used in the positioning system will be calibrated according to manufacturer's instructions. Checks will be performed on the positioning system prior to the backfilling operation to confirm that specifications are met. Periodic checks with a separate GPS unit will be conducted to verify that the sensors are performing in accordance with the specification for horizontal positioning.

2.12 HYDROGRAPHIC SURVEYING DURING DREDGING OPERATIONS

GE will provide a third-party independent surveyor to conduct multi-beam hydrographic surveying for use in construction QA and progress reporting. This surveyor will conduct a hydrographic verification survey of each CU or sub-unit of a CU once notified by the Dredging Contractor that particular work in a CU, i.e., a dredging pass or placement of backfill/cap material, has been completed. Third-party surveyor methods and procedures are discussed in the 2011 DQAP (Appendix A).

To increase the efficiency of the CU acceptance process, the CM may direct the third-party surveyor to commence CU acceptance surveys in portions of a CU that have been deemed complete by the Dredging Contractor while the Dredging Contractor finishes dredging or placement of backfill/cap material in other portions of the same CU.

The Dredging Contractor may conduct its own multi-beam or single-beam hydrographic survey to verify that an area has been successfully dredged prior to the request for the third-party surveyor.

2.13 DEMOBILIZATION ACTIVITIES

This section describes the demobilization activities to be conducted by the Dredging Contractor, including decontamination of equipment. Demobilization of the sediment processing facility at the end of 2011 is described in Section 6 of the 2011 Facility O&M Plan.

Demobilization is the process of taking apart of equipment, transporting equipment away from the job site, dismantling support facilities, removing temporarily installed structures and equipment, and general cleaning up of work areas. A summary of the activities that may be performed during dredging operations demobilization is provided below:

- Dismantle and remove field offices including project administration buildings.
- Remove signage, and other community protections.
- Remove any project survey equipment such as base stations.
- Remove and dismantle floating equipment that will be trucked off-site.
- After required decontamination and once CM approval has been received, transport equipment off-site.
- Remove any unused materials on site or move stockpiles to locations designated by the CM.

- Clean up work areas including the Work Wharf and Work Support Marina.

On-site equipment used for debris removal and dredging operations is expected to come into contact with contaminated sediment. As project operations proceed, and backfill or capping operations start, clean equipment designated for backfill/capping work may be brought on site or equipment used for dredging may be shifted to backfill/capping work. Barges, excavators, and any other equipment used for dredging or debris removal will be decontaminated prior to their use for backfill and capping operations. The equipment decontamination procedure is a multi-step process, as outlined below:

1. Remaining sediment will be physically removed from equipment surfaces through use of shovels, brooms, and other hand tools as necessary to clean surfaces.
2. Equipment surfaces will be washed, using pressure washers where appropriate, to ensure removal of any additional contaminated sediment that may remain. Washing will be done in an area designated for that purpose (see step 7 below) and water from the wash operation will be collected and treated.
3. All equipment will be visually inspected as "clean" prior to transfer for use in backfill/capping operations.
4. A daily log will be kept for equipment designated for dredging versus backfill/capping. Equipment will be appropriately marked as designated for dredging or backfill/capping to prevent the potential for cross contamination.
5. An equipment decontamination status report will be provided to the CM every morning. This report will document the equipment status for continued operation. A decontamination documentation report will be provided to the CM to certify that decontamination has been completed on all equipment before it is demobilized.
6. The equipment decontamination location(s) will be established to provide the most flexibility to the Dredging Contractor to ensure that it can adequately and timely decontaminate the necessary equipment.
7. It is expected that most of the equipment decontamination activities will occur inside a hopper barge or on a deck barge that has raised sealed edges. This is the preferred method since all of the activities can be performed inside the barge using the walls and floor as containment of decontamination fluids and solids. A collection area will be established to allow for the removal of decontamination liquids and solids either through a pumping system or vacuum system. This material will then be transported to the unloading wharf for proper unloading and disposal by others.

   Equipment such as tools, excavator buckets, and sheet pile sections will be lowered into the hopper barge, where it will be decontaminated. Cleaned equipment will be raised out of the hopper barge and stored on land in a designated area for final decontamination verification.

There are two levels of decontamination that are established for the project. The first level is for equipment that will remain dedicated to project use and may be used for other operations,

such as backfilling, or be stored for potential use in future years of work. The standard of decontamination for equipment that will remain dedicated to future potential project use is the removal of all visible sediment on the surface of the equipment. The second level of decontamination is for dredging equipment that will no longer be used on the project. The standard of decontamination for such dredging equipment is the removal of visible material and further power washing of surfaces so that the cleaned surface can be wipe tested to show that low-contact surfaces contain less than 100 µg PCBs per 100 cm^2 and high contact areas (e.g., hand rails) contain less than 10 µg PCBs per 100 cm^2.

SECTION 3

HABITAT CONSTRUCTION

[This section will be provided in an addendum to this RAWP once input has been gained from the Habitat Construction Contractor.]

SECTION 4

CONSTRUCTION SCHEDULE

4.1 OVERVIEW

The construction schedule for 2011 D&FO is presented as Figure 4-1. This schedule identifies the major construction and operational activities, sequencing for the dredging operations, processing facility operations, rail yard operations (including the loading and off-site shipments of processed material), and habitat construction activities required to complete the 2011 D&FO.

The construction schedule describes the anticipated reasonable durations for the 2011 D&FO activities described in Sections 2 and 3 of this 2011 RAWP, Section 2 of the 2011 Facility O&M Plan, and Section 5 of the 2011 TDP. The schedule accounts for seasonal limitations for construction in the Upper Hudson Work Area (e.g., ice formation, safe working conditions such as water temperatures and flow conditions).

In addition, the dredge production schedule is presented in Table 4-1 (discussed in Section 4.3 below). This production schedule identifies the *in situ* volumes of dredged material targeted for removal during each month of the 2011 dredging season.

4.2 INTERFACE POINTS WITH OTHER CONSTRUCTION ACTIVITIES

As described in Section 1, the 2011 D&FO is divided into four major contracts: Processing Facility Operations (Contract 30), Dredging Operations (Contract 40), Habitat Construction (Contract 50), and Rail Yard Operations (Contract 60). The interface points between these contractors are listed below.

The key interface points between the Dredging Contractor (Contract 40) and the PFOC (Contract 30) are as follows:

- The Dredging Contractor will load sediment barges with sediment and debris, and then transport the sediment barges to the unloading wharf. The Dredging Contractor will provide the PFOC with advance notice prior to delivering a barge of sediment or debris to the unloading facility.
- The Dredging Contractor will either attach the barge to be unloaded to the barge breasting system or, if the barge breasting system is in use, will tie up the barge to the fendering to the north or the south of the unloading wharf, and will transfer the barge trip log to the PFOC. If all mooring locations at the unloading wharf are used, the Dredging Contractor will temporarily anchor the barge elsewhere until a mooring location becomes available. Double-breasting of barges at the unloading wharf is not permitted without approval from NYSCC.

- The PFOC will then unload the barge and return it to the Dredging Contractor. The PFOC will provide advance notice to the Dredging Contractor that the barge has been unloaded and is available for loading.
- The PFOC and the Dredging Contractor will provide to each other a single point of contact that is accessible 24 hours a day during operations to allow co-ordination of activities.

The key interface points between the PFOC (Contract 30) and the RYOC (Contract 60) are as follows:

- The PFOC will transfer the processed sediments, including the processed fine material (filter cake) and separated coarse material, as well as any debris, to the material staging areas. The PFOC will then remove those materials from the staging areas, load them into rail containers (waste enveloping liners), and seal the rail car containers prior to shipment. The PFOC will also be responsible for placing and closing the rail car containers.
- The RYOC will place rail cars for loading (see 2011 TDP in Appendix C) and move the rail cars after they are loaded. These activities will be closely coordinated with the PFOC.

4.3 DREDGING PRODUCTION SCHEDULE

The dredging production schedule identifying the *in situ* volumes of material targeted for removal for each 4-week period of the 2011 dredging season is presented in Table 4-1. This table is based on the initial dredge prisms issued to the Dredging Contractor for planning purposes. Final dredge prisms based on the 2010 sampling are currently under review by EPA. Once approved by EPA, these final prisms will be used to recalculate the *in situ* volumes. The recalculated target removal volumes will be provided in the first monthly productivity report for the 2011 Dredging Operations. The volumes in the table do not include volumes associated with any additional dredging passes needed to achieve the requirements of the Residual Standard; those volumes are unknown at this time but will be included in the volumes to be reported in the weekly and monthly productivity reports for the 2011 Dredging Operations. Once additional dredging pass volumes have been included, it is estimated that the total volume targeted for removal during the 2011 dredging season will meet or exceed the target for sediment processing of 350,000 cy. In addition, the volumes in the table represent an estimate of the dredged material targeted for removal in each 4-week period; the actual amount removed may be more or less depending on field conditions.

Table 4-1 *In situ* Volume of Sediment Targeted for Removal (cy)

4-Week Period	*In situ* Volume of Material Targeted for Removal (cy)
1: Weeks 1 – 4	41,300
2: Weeks 4 - 8	53,900
3: Weeks 9 - 12	55,000
4: Weeks 13 – 16	55,100
5: Weeks 17 – 20	52,500
6: Weeks 21 - 24	17,500
Total	275,300

4.4 ASSUMPTIONS AND QUALIFICATIONS

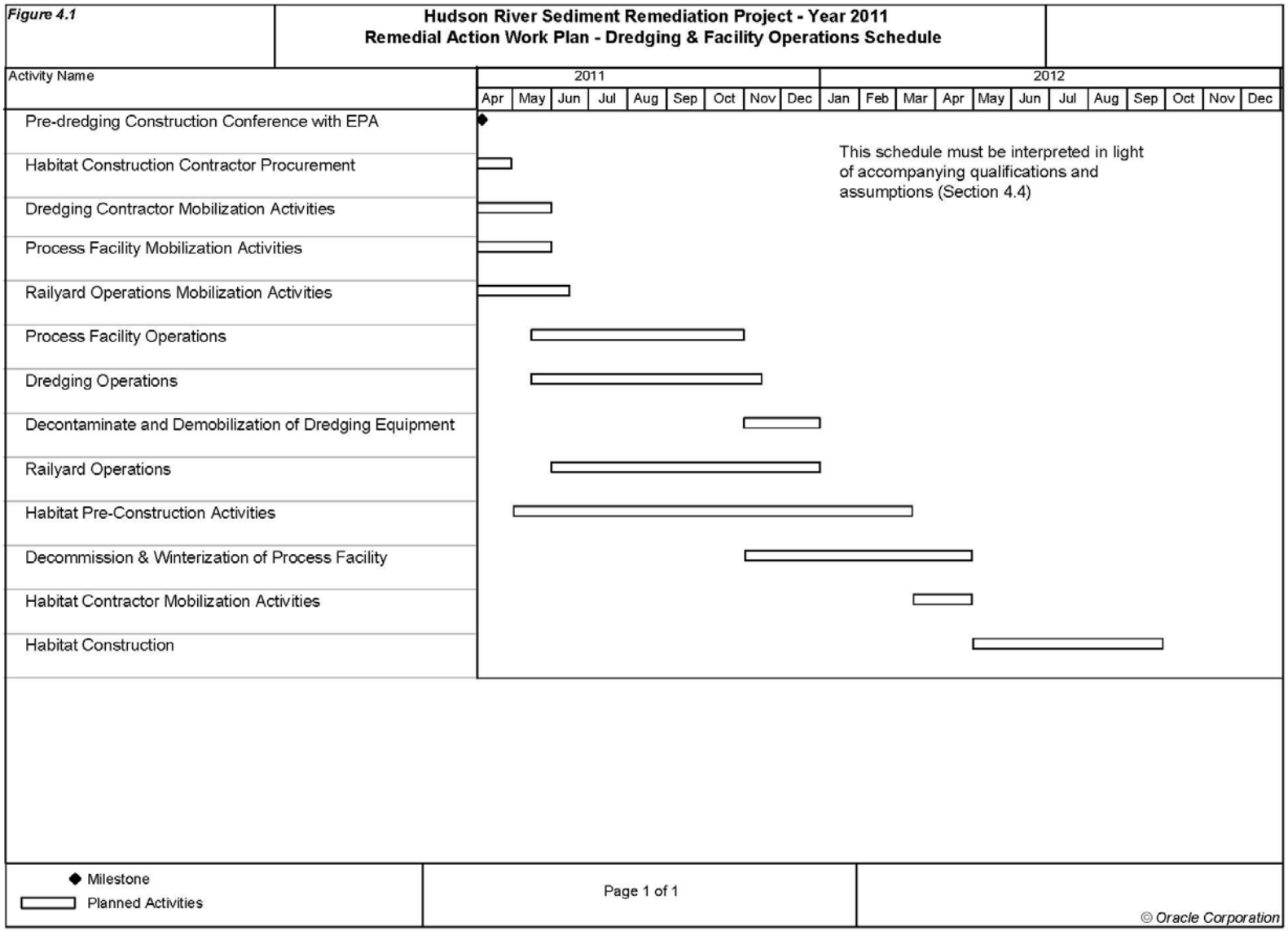
The construction schedule and dredging production schedule shown in Figure 4-1 and Table 4-1 are based on the following assumptions and qualifications: (Note that the necessary access agreements mentioned in the following list are discussed in more detail in the 2011 PAP in Appendix E.)

- Third-party entities, including, but not limited, to utility service providers, rail carriers, and disposal facilities, honor existing contracts.
- Start-up and testing of the improvements to the sediment processing facility is successfully completed by May 1, 2011.
- EPA approves the final revised 2011 RAM QAPP in sufficient time to allow commencement of the necessary monitoring for 2011 D&FO on planned schedule.
- EPA approves the final 2011 RAWP, including all appendices, in sufficient time to allow commencement of the 2011 D&FO on the planned schedule.
- Proposed work hours are unchanged.
- Proposed equipment type and quantity are unchanged.
- NYSCC will operate locks on a 24-hour per day basis at the NYSCC locks needed for 2011 D&FO.
- Weather conditions meet average seasonal limitations for construction in the Upper Hudson River work area (e.g., frost conditions, high water events, ambient temperature limitations).

- NYSCC opens Champlain Canal system for commercial navigation by May 1 and the Champlain Canal system remains open and available for use of commercial vessels until November 15.
- Actual site conditions are consistent with site condition data that have been previously obtained and relied upon for the basis of design and construction.
- Sufficient natural run-of-bank material is available at the approved source(s) to satisfy backfill requirements.
- The distribution of backfill and cap material placed within a given CU is consistent with the overall distribution of backfill and cap material described in the 2011 FDR.
- The amount and location of in-river debris encountered during dredging operations are limited to the debris identified from data that have been previously obtained and relied upon for the basis of design and construction.
- River flows are greater than 10,000 cfs for no more than the seasonal average.
- EPA approves CU Dredging Completion and CU Backfill/Engineered Cap Completion within 24 hours from the receipt of the applicable forms from GE.
- Multi-beam bathymetric surveys and confirmatory sediment sampling in a completed CU take no longer than 6 days.
- No potential significant archaeological resources or human remains are discovered during the course of the 2011 D&FO.
- Project team representatives are available on a 24-hours-per-day and 7-days-per-week basis for review, coordination, and approval.
- Recreational vessel traffic is consistent with or less than historical seasonal averages.
- The necessary satellite and wireless communication signals are available with the required strength, consistency and reliability to provide the positioning and communication systems necessary to perform the 2011 D&FO work.
- Spare parts on hand are based on manufacturer's recommendations and are sufficient to maintain operations.
- No delays are incurred due to visual plumes during the placement of the backfill materials with the required fines content.
- Backfill and cap placement ends sufficiently in advance of the closing of the Champlain Canal system to permit demobilization of equipment through that system.
- All necessary backfill materials in habitat construction areas have been placed and approved by EPA by the completion of the 2011 dredging season.
- Rail carriers and disposal facilities are able to handle the transport and disposal of the volume of processed sediments as anticipated.
- The schedule does not account for events that are beyond the control of GE.

- Material and equipment fabrication and delivery times are estimated; actual fabrication and delivery times are controlled by market conditions and will be determined at the time orders are placed.

FIGURE 4-1 DREDGING AND FACILITY OPERATIONS CONSTRUCTION SCHEDULE



SECTION 5

COMPLIANCE MONITORING

This section provides a very brief overview of the monitoring activities that GE will conduct during the 2011 D&FO to assess achievement of the Phase 2 EPS (EPA, 2010a), Phase 2 QoLPS (EPA, 2004, 2010b), and Phase 2 WQ Requirements (EPA, 2005, 2006, as modified by the Phase 2 EPS and revised SOW attachments). A detailed description of these performance standards and requirements, the specific requirements for this monitoring, and the monitoring programs that GE will conduct during 2011 to meet the requirements of the EPS, QoLPS, and WQ Requirements will be provided in the 2011 RAM QAPP.

5.1 EPS COMPLIANCE MONITORING

The EPS consist of three performance standards:

1. Resuspension Performance Standard;
2. Residuals Performance Standard; and
3. Productivity Performance Standard.

Under each of these standards, GE will conduct extensive monitoring during the 2011 D&FO, as summarized below.

Resuspension Performance Standard

GE will conduct routine resuspension monitoring during dredging and associated operations that have the potential for resuspending a significant amount of sediment. Monitoring will be conducted at near-field and mid-field stations, located downstream of the dredging activities, for PCBs, total suspended solids (TSS) metals, as well as a number of general water quality parameters such as pH, dissolved oxygen, temperature, and conductivity. Monitoring will also be conducted at far-field stations, located more than one mile downstream of dredging activities, for PCBs, TSS, and other general water quality parameters. The resulting data will be compared against various criteria set forth in the Resuspension Performance Standard to assess the need for response actions, as described in the 2011 PSCP.

Residuals Performance Standard

GE will conduct sampling of the sediments in dredged areas and certain backfilled/capped areas. Cores of sediment will be collected once target design or re-dredge sediment removal has been confirmed by the third-party hydrographic surveyor. The samples will be analyzed and the results will dictate the appropriate response actions to be undertaken, as described in the 2011 PSCP. Cores will also be collected in backfill and the chemical isolation areas of caps.

Productivity Performance Standard

GE will conduct monitoring of productivity during the 2011 D&FO. The monitoring will consist of tracking the dredging productivity – including volumes of *in situ* sediments removed, total tonnage processed, and total tonnage transported off-site for disposal – on a 4-week and

cumulative basis. This information will be compared to the scheduled production shown in Table 4-1 to determine whether the estimated volume of sediment to be dredged in 2011 may be increased or decreased.

5.2 QoLPS COMPLIANCE MONITORING

The QoLPS include five performance standards:

1. Air Quality Performance Standard;
2. Odor Performance Standard;
3. Noise Performance Standard;
4. Lighting Performance Standard; and
5. Navigation Performance Standard.

Each of these standards will also require monitoring, as summarized below.

Air Quality Monitoring

GE will conduct routine air quality monitoring for PCBs in ambient air. GE will sample the air continuously (24 hours each day that operations are taking place near the given station) at stations at the sediment processing facility and unloading area, at a permanent background station, and at stations within the dredging corridor, with PCB analysis of 24-hour average samples. The results will be compared with criteria in the Air Quality Performance Standard. In addition, GE will conduct monitoring for opacity in response to observations or a complaint indicating a potential opacity issue.

Odor Monitoring

GE will perform odor sampling if on-site workers detect an uncomfortable project-related odor or if an odor complaint is received from the public in the vicinity of the remediation zone. If the odor is identified as potentially hydrogen sulfide (H_2S), monitoring for H_2S will be performed upwind and downwind of the suspected source.

Noise Monitoring

The D&FO contractors will conduct noise monitoring at the initial start-up of any operation or equipment that is different from that used in Phase 1 (or previously in 2011) to demonstrate compliance with the Noise Performance Standard. If that monitoring indicates the potential for exceedances of the criteria in the standard, additional monitoring will be conducted closer to receptors to evaluate attainment of those criteria. In addition, GE will conduct noise monitoring at the processing facility and within the dredging corridor whenever a complaint from the public is received. The noise measurements will be compared with the criteria in EPA's Noise Performance Standard to determine the need for additional monitoring or further noise mitigation measures.

Lighting Monitoring

The D&FO contractors will conduct light monitoring at the initial start-up of any operation or equipment that is different from that used in Phase 1 (or previously in 2011) to demonstrate compliance with the Lighting Performance Standard. If that monitoring indicates the potential for exceedances of the lighting standards, additional monitoring will be conducted closer to receptors to evaluate attainment of those standards. In addition, GE will conduct light monitoring at the processing facility and within the dredging corridor whenever a complaint from the public is received. The light measurements will be compared with the criteria in EPA's Lighting Performance Standard to determine the need for additional monitoring or further lighting mitigation measures.

Navigation Monitoring

GE will conduct routine monitoring of marine traffic after dredging operations begin. This routine monitoring will involve the recording in daily logs of information about river navigation activities in the vicinity of in-river project operations. GE will also monitor marine traffic within the 2011 project area during mobilization and demobilization activities. The information from these monitoring activities will be used to assess the need for any changes in project-related navigation.

5.3 WQ REQUIREMENTS COMPLIANCE MONITORING

The substantive WQ Requirements were issued by EPA after consultation with NYSDEC. They consist of: (1) requirements relating to in-river releases of constituents not subject to the EPS; (2) requirements relating to discharges of treated water from sediment processing operations, as well as storm water from areas within the processing facility where PCB-containing sediments will be managed, to the Champlain Canal; and (3) requirements relating to discharges of non-contact storm water, during overflow of the sedimentation basins at the processing facility, to Bond Creek.

For the in-river releases of constituents not subject to the EPS, GE will conduct sampling for certain metals daily at near-field water monitoring stations for the first two weeks of the 2011 dredging season and thereafter weekly at the first downstream far-field station. GE will also monitor other water quality parameters at the near-field and mid-field stations. The results will be compared with the applicable criteria in the WQ Requirements, as provided in the 2011 PSCP and 2011 RAM QAPP.

For the discharges to the Champlain Canal and Bond Creek, GE will perform regular monitoring of those discharges for comparison with effluent limits established by EPA after consultation with NYSDEC.

SECTION 6

HEALTH, SAFETY, AND ENVIRONMENTAL PROTECTION MEASURES

6.1 D&FO HEALTH AND SAFETY POLICY, PROGRAM AND PLAN

6.1.1 GE Environmental Health and Safety Policy

GE provides a safe and healthy working environment in all the communities in which it does business. GE's environmental health and safety (EHS) programs combine clear leadership by management; the participation of all employees, contractors, and functions; and the use of appropriate technology to confirm the health and safety of its employees and the public.

GE requires that each of its facilities and sites identify and control potential hazards in order to protect the public, its employees, and the environment. Reviews are conducted regularly; deficiencies, if any, are identified; issues are tracked to closure; improvements are made to prevent potential hazards; and mitigation measures are implemented as a result of these reviews. The end result enhances injury prevention, increases operations knowledge, improves communications, and helps ensure compliance with required EHS standards.

The 2011 D&FO will abide by the requirements of GE's world-class EHS program.

6.1.2 CM Health and Safety Program

The CM also holds the highest standards for project health and safety. The safety goal for this project is zero incidents, zero injuries – a Zero Incident philosophy. This approach originated with a study by the Construction Industry Institute, which identified specific control measures shown to dramatically reduce the probability of incidents. These control measures, known as Zero Incident Techniques, provide the framework for safety on this project, and the for the project team's proactive approach to managing the interrelated areas of safety, health, environment, and risk management. The definition of an incident is any unplanned or unexpected event that results in or has the potential to result in a personal injury, property damage, or an environmental release.

6.1.3 Health and Safety Plans

6.1.3.1 Remedial Action Health and Safety Plan for 2011

The *Phase 2 Remedial Action Health and Safety Plan for 2011* (2011 RA HASP) (Parsons, 2011), which is being submitted to EPA concurrently with this 2011 RAWP, defines minimum safety and health requirements, guidelines, and practices applicable to the overall project. This 2011 RA HASP constitutes an update of the Phase 1 RA HASP. In addition to the previous information, the updated RA HASP addresses additional safety and health requirements identified during the Phase 1 dredging operations, sediment processing facility operations, rail yard operations, and habitat construction activities. For complete details on the project health and safety program, please refer to the 2011 RA HASP.

The 2011 RA HASP reflects the corporate policy of both GE and the CM. The 2011 RA HASP uses the Zero Incident management approach and defines the safety goal for this project as zero incidents and zero injuries.

The 2011 RA HASP provides a general description of field activities. Specific field activities are described in more detail in the Contractors' HASPs. The objectives of the 2011 RA HASP are to:

- Establish minimum health and safety requirements;
- Identify the physical, chemical, and biological hazards potentially present during field work associated with the 2011 RAWP;
- Prescribe the protective measures necessary to control those hazards;
- Define emergency procedures; and
- Prescribe training and medical qualification criteria for site personnel.

The 2011 RA HASP will be reviewed by all contractors and subcontract managers, supervisors, foremen, and safety personnel. All craft personnel performing field activities will receive a site-specific project orientation summarizing the content of the 2011 RA HASP. All personnel will be required to sign the appropriate documentation acknowledging an understanding of the 2011 RA HASP requirements.

The 2011 RA HASP was written to comply with the requirements of the Occupational Safety and Health Administration (OSHA) Hazardous Waste Operations and Emergency Response Standard (29 Code of Federal Regulations [CFR] 1910.120).

6.1.3.2 Contractors' Health and Safety Plans

Each contractor is required to prepare a Contractor HASP for review and approval by the CM. Each contractor's HASP will discuss tasks and provide detailed procedures and activity hazard analyses specific to its scope of work.

The Contractor HASPs will conform to the 2011 RA HASP and will be reviewed by the CM.

6.1.4 Designated Site Work Zones

To promote the protection of worker health and safety and prevent the off-site migration of PCB-containing materials, the sediment processing facility contains specified work zones, consisting of an Exclusion Zone, a Contamination Reduction Zone, and a Support Zone. These zones are described in Section 5.1 of the 2011 Facility O&M Plan (Appendix A).

In accordance with the 2011 RA HASP, Dredging Contractor vessels that handle or contain PCB-contaminated material will also contain specified work zones. These zones are as follows:

- The Exclusion Zone is a segregated area of all dredges, debris removal rigs and sediment barges that handle or carry PCB-contaminated material. The Exclusion Zone is the portion of the vessel that may come into contact with PCB-contaminated material. Within the Exclusion Zone, all personnel will wear appropriate personal

protective equipment (PPE), and personnel and equipment will be decontaminated before moving out of the Exclusion Zone.

- The Contamination Reduction Zone (CRZ) is the transition area from the Exclusion Zone to non-contaminated areas. CRZs will be located on all dredges and debris removal rigs that handle PCB-contaminated materials. The CRZ will be physically sectioned off from the Exclusion Zone and from non-contaminated areas, and is the area where decontamination of personnel will take place.
- The Support Zone is the clean area of all dredges and debris removal rigs that handle PCB-contaminated materials. Crew boats and supply boats dropping off or picking up personnel and supplies will dock at that portion of the dredge or debris removal rig.

6.1.5 Personnel Decontamination

Decontamination of PFOC and RYOC personnel at the sediment processing facility are described in Section 9 of the 2011 RA HASP and Section 5.2.1 of the 2011 Facility O&M Plan. Dredging Contractor personnel that enter Exclusion Zones or have come into contact with possible PCB-containing sediment will follow the personnel decontamination procedures detailed in Section 9.2 of the 2011 RA HASP. Decontamination will occur within the designated CRZ on board the Dredging Contractor's dredges and debris removal rigs that handle PCB-contaminated materials.

Disposable PPE will be placed into containers that will be placed on sediment barges or tugs that are being transported to the unloading wharf where the PFOC will place the disposable PPE in railcars for off-site disposal in accordance with the 2011 TDP (Appendix C). Decontamination water (not containing surfactants or solvents) used in the CRZ will be placed into the sediment barge hopper with the dredged sediment.

HCC personnel will not be expected to come into contact with PCB-contaminated materials, and thus no decontamination procedures for HCC personnel will be necessary.

6.2 SPILL AND STORMWATER POLLUTION PREVENTION AND RESPONSE

Pollution prevention measures at the sediment processing facility, including spill prevention and storm water pollution prevention measures, are described in Section 5.3 of the 2011 Facility O&M Plan. Section 8 in the TDP also describes spill prevention and storm water pollution prevention measures at the sediment processing facility, including the rail yard. Spill reporting and response actions during in-river operations, at the Work Support Marina, and at the sediment processing facility will be detailed in Section 7 of the 2011 CHASP.

6.3 EMERGENCY CONTACT NUMBERS

Emergency contact information and procedures are presented in Section 10 of the 2011 RA HASP and will also be included in the 2011 CHASP.

6.4 CONTRACTOR MONITORING

GE will separately contract for monitoring of the parameters addressed by the Phase 2 EPS, QoLPS, and WQ Requirements, including the water column, airborne PCBs, and (when necessary) opacity, odors, noise, and light, to assess achievement of the criteria set forth in those standards and WQ Requirements. This monitoring was summarized in Section 5 above. Methods for such monitoring will be described in detail in the 2011 RAM QAPP, and the actions to be taken in the event of an exceedance of such criteria, or in response to complaints about these parameters, are described in the 2011 PSCP.

In addition, in accordance with the project technical specifications, the Dredging Contractor, HCC, PFOC and RYOC will conduct monitoring within their work areas for noise and light. This work area monitoring will be conducted solely for operations management purposes – to verify compliance with contract specifications and to provide a guide to the contractors of the potential for noise or light levels to exceed the applicable QoLPS criteria at nearby receptors. In addition, the Dredging Contractor will conduct monitoring of certain water quality parameters to verify compliance with contract specifications. Based on the work area monitoring results, the contractors can implement controls strategies as appropriate. This work area monitoring should not be considered as monitoring to assess or verify achievement of the EPS, QoLPS, or WQ Requirements.

SECTION 7

REPORT ON 2011 ACTIVITIES

In accordance with Section 5.5 of the revised SOW, within 30 days of the end of work activities for the 2011 season – i.e., 30 days after completion of dredging, backfilling, capping, shoreline reconstruction/stabilization, and sediment process/water treatment for that season – GE will submit to EPA an annual report on those activities. That report will include the information specified for that report in Section 5.4 of the 2011 PSCP (Appendix D). It will also include record drawings signed and stamped by a professional engineer registered in the State of New York and other supporting documentation to demonstrate that the 2011 CQAP was followed.

In addition, the work conducted in 2011 will be included in the final Remedial Action Report to be submitted at the conclusion of Phase 2 in accordance with Paragraph 57.b of the CD.

SECTION 8

REFERENCES

United States Environmental Protection Agency, 2002. *Hudson River PCBs Site, Record of Decision*. February.

United States Environmental Protection Agency, 2004. *Quality of Life Performance Standards, Hudson River PCBs Superfund Site.* Prepared for EPA by Ecology and Environment, Inc, Washington, DC. May.

United States Environmental Protection Agency, 2005. *Substantive Requirements Applicable to Releases of Constituents not Subject to Performance Standards; Substantive Requirements of State Pollutant Discharge Elimination System Permit for Potential Discharges to Champlain Canal (land cut above Lock 7); and Substantive Requirements of State Pollutant Discharges to the Hudson River*. Washington, DC. January.

United States Environmental Protection Agency and General Electric Company, 2005. Consent Decree in *United States v. General Electric Company*, Civil Action No. 05-cv-1270, lodged in United States District Court of the District of New York on October 6, 2005; entered by the Court on November 2, 2006.

United States Environmental Protection Agency, 2010a. *Hudson River PCBs Site – Revised Engineering Performance Standards for Phase 2*. Prepared for EPA by Louis Berger Group, December.

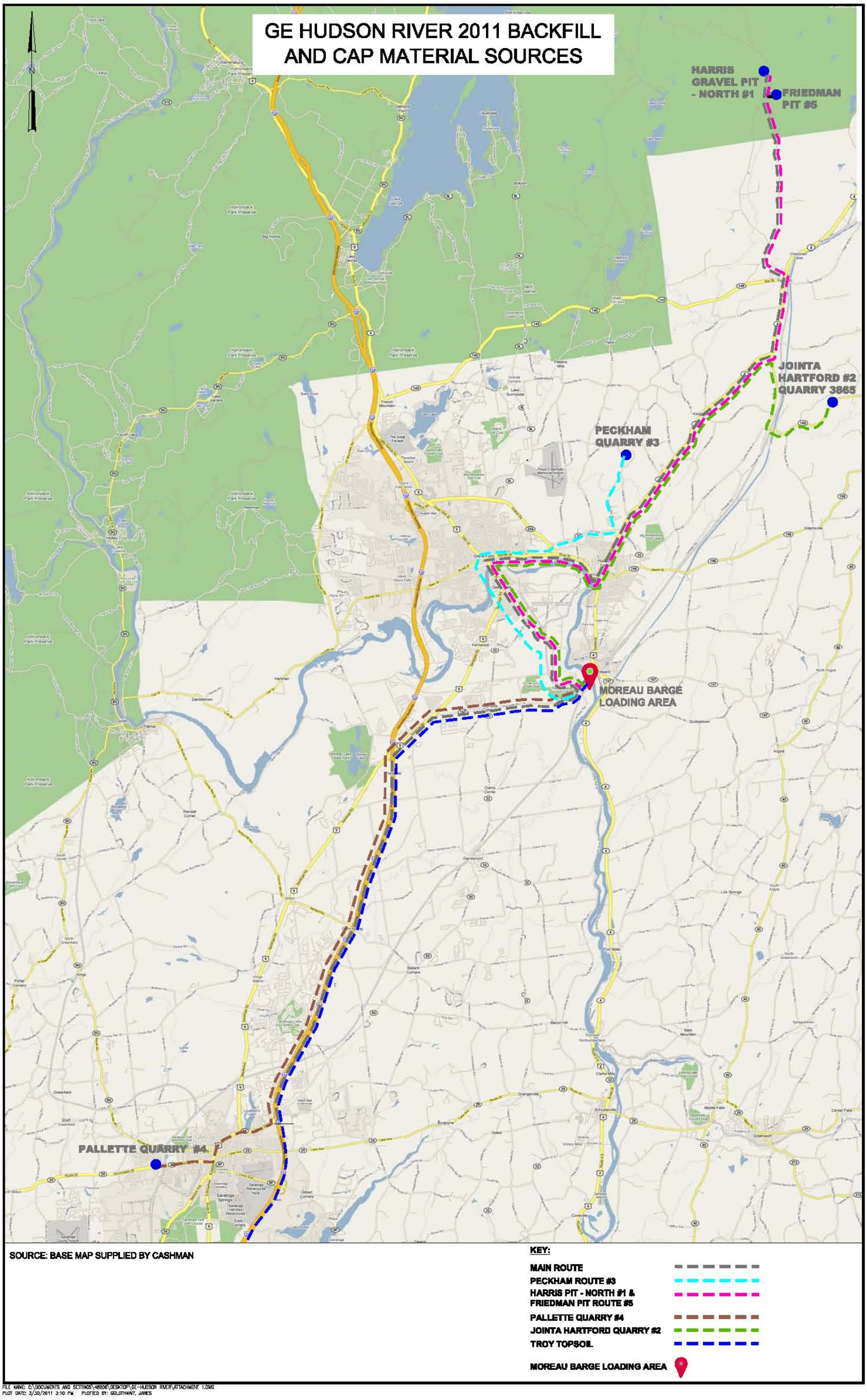
United States Environmental Protection Agency, 2010b. Technical Memorandum - *Quality of Life Performance Standards Phase 2 Changes*. December.

Parsons, 2008. *Remedial Action Health and Safety Plan, Hudson River PCBs Superfund Site.* Revision 1. (RA HASP). August.

Parsons, 2011. *Phase 2 Remedial Action Health and Safety Plan for 2011, Hudson River PCBs Superfund Site.* (2011 RA HASP). April.

ATTACHMENT 1

MATERIAL SOURCES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PALLETTE QUARRY #4
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PECKHAM ROUTE #3
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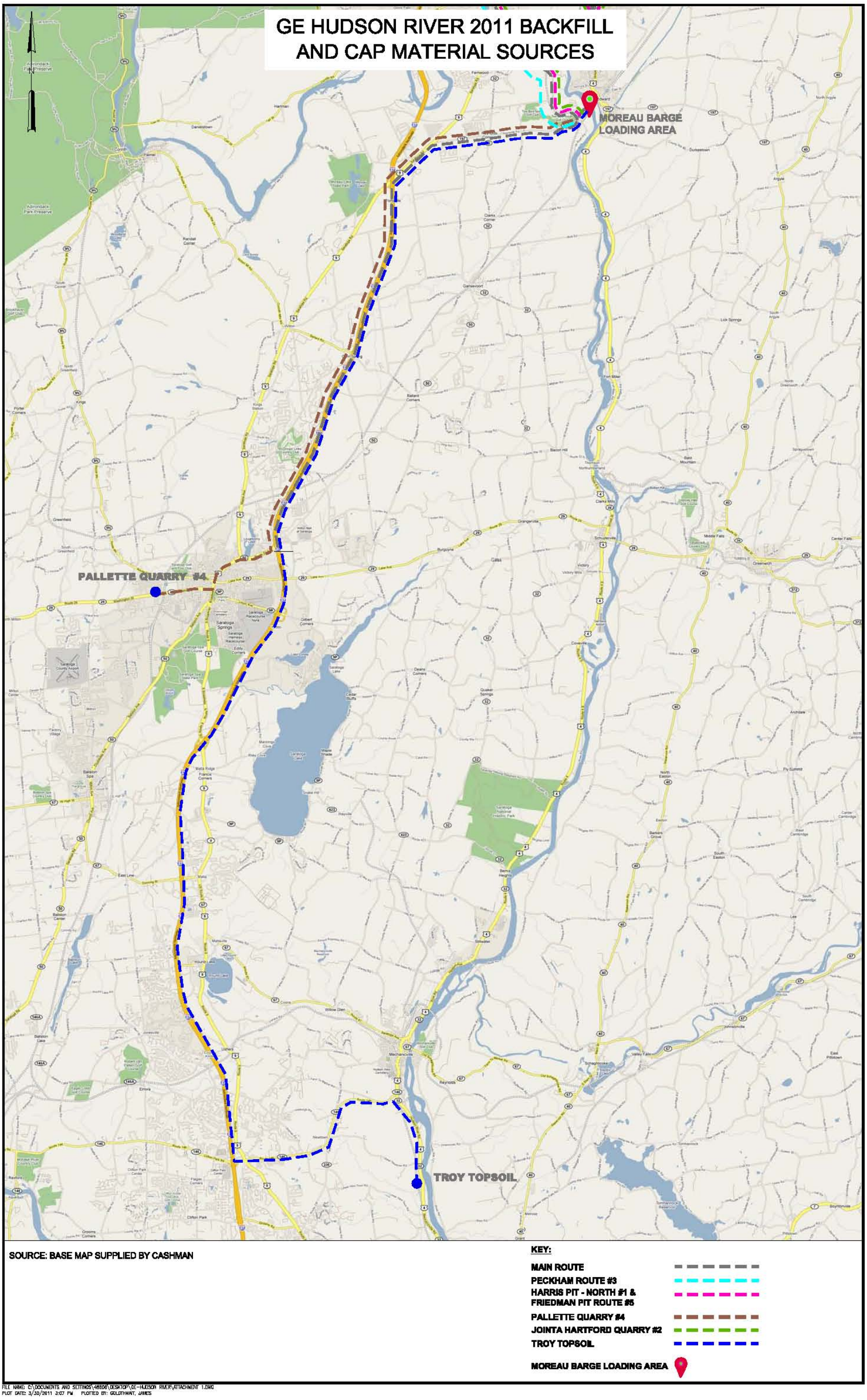
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AND CAP MATERIAL SOURCES
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LOADING AREA
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